Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

July 13, 2017

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification**
93 (a/k/a 91) Roxbury Road, Niantic (East Lyme), Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 149-foot level of the existing 151-foot tower at 93 Roxbury Road in Niantic, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 1994 (Docket No. 116). Cellco now intends to replace three (3) of its existing antennas with three (3) model QUAD656C0000x, 700 MHz antennas, at the same 149-foot level on the tower. Cellco also intends to replace six (6) remote radio heads ("RRHs") with six (6) newer model RRHs, located behind its antennas. Included in Attachment 1 are specifications for Cellco's replacement antennas and RRHs.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mark C. Nickerson, East Lyme First Selectman; Gary A. Goeschel, II, Director of Planning; and Crown, the owner of the tower. The Town of East Lyme is the owner of the Property.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRH's will be located at the 149-foot level on the 151-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case General Power Density table for Cellco's modified facility is included in Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

A copy of the parcel map and property owner information is included in Attachment 4. A Certificate of Mailing verifying that this filing was sent to municipal officials and the owner of the Property is included in Attachment 5. A copy of the stamped Certificate of Mailing will be forwarded to the Council upon receipt.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

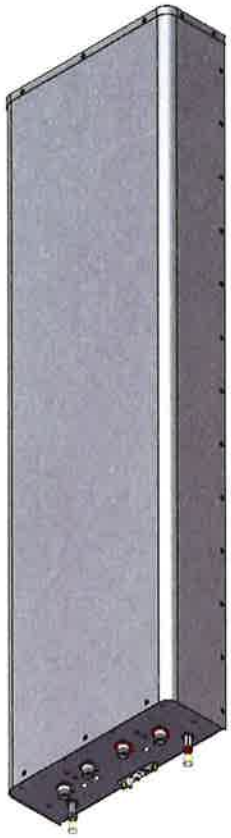
Enclosures
Copy to:
Mark C. Nickerson, East Lyme First Selectman
Gary A. Goeschel, II, Director of Planning
Crown Castle
Tim Parks, Verizon Wireless

ATTACHMENT 1

QUAD656C0000x

Twin Band | Quad Port | Panel Antenna | (2x) X-Pol | 65° / 65° | 15.0 / 15.0 dBi | Variable Tilt

- Twin band, quad-port panel antenna with variable electrical tilt
- 4x4 MIMO
- Patented internal RET actuator adds no additional length to the antenna



Ordering Options	Model Number
When ordering, replace "x" in the model number with one of the options listed below.	
Manual Electrical Tilt	QUAD656C0000M
Remote Electrical Tilt AISG v2.0 / 3GPP with an MDCU RET Actuator	QUAD656C0000G
Remote Electrical Tilt AISG v2.0 / 3GPP with an MDDU RET Actuator	QUAD656C0000L
Mounting bracket kits and other accessories are ordered separately.	

Electrical Characteristics		(2x) 696-900 MHz	
Frequency Bands		696-806 MHz	806-900 MHz
Polarization		(2x) ±45° (Quad-Pol)	
Horizontal Beamwidth		67°	66°
Vertical Beamwidth		13.6°	12.4°
Gain		14.5 dBi	15.0 dBi
Electrical Downtilt		0-12°	
Impedance		50Ω	
VSWR		≤ 1.5:1	
Upper Sidelobe Suppression		18 dB	18 dB
Front-to-Back Ratio		> 25 dB	> 25 dB
Inband Isolation		25 dB	
Isolation Between Bands		28 dB	
IM3 (2x20W carrier)		< -153 dBc	
Input Power		(4x) 500 W	
Total Number of Connectors		Antennas has 4 connectors located at the bottom	
Connectors Per Band	696-900 MHz	(2x) 7/16-DIN Female	
	696-900 MHz	(2x) 7/16-DIN Female	
Diplexed		No	
Lightning Protection		Direct Ground	
Operating Temperature		-40° to +60° C (-40° to +140° F)	

Mechanical Characteristics			
Dimensions (Length x Width x Depth)		1889 x 520 x 182 mm	74.4 x 20.5 x 7.2 in
Depth with Z-Brackets		227 mm	8.9 in
Weight without Mounting Brackets: MET		24.5 kg	54.0 lbs
Weight without Mounting Brackets: RET		24.8 kg	54.7 lbs
Survival Wind Speed		> 241 km/hr	> 150 mph
Wind Area	Front	0.98 m^2	10.6 ft^2
	Side	0.34 m^2	3.7 ft^2
Wind Loads (160 km/hr or 100 mph)	Front	1200 N	270 lbf
	Side	415 N	93 lbf

Quoted performance parameters are provided to offer typical, peak or range values only and may vary as a result of normal testing, manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to products may be made without notice.

QUAD656C0000x

Twin Band | Quad Port | Panel Antenna | (2x) X-Pol | 65° / 65° | 15.0 / 15.0 dBi | Variable Tilt

Electrical Downtilt Control		
Electrical downtilt for each band can be controlled separately. Tilt indicator(s) are covered by removable transparent cap(s).		
Manual Electrical Tilt (MET) Control	A colored knob at the end of the tilt indicator allows change of the tilt without need of a tool. The knob color is identical to the corresponding connector ring color. To access the knob, remove the cap by turning it counter-clockwise. It is re-installed by opposite rotation. Do not remove the transparent cap(s) from the antenna.	
Remote Electrical Tilt (RET) Control	The remote control of the electrical tilt is managed by either a Multi-Device Control Unit (MDCU) or a Multi-Device Dual Unit (MDDU) inserted in the bottom of the antenna. A single actuator individually controls the tilt of each band (no need for daisy chain cables between the bands). This module does not add any additional length to the antenna. For RET control, the transparent caps must be in place and locked. The tilt angle indicators always remain visible and the antenna still has manual tilt control (manual override).	
RET Actuator	Select one of the following RET actuators when ordering this antenna.	
	Multi-Device Control Unit (MCDU)	The MDCU is an electronic module that allows the remote control of the electrical downtilt (RET) in Amphenol antennas with factory embedded motors. The MDCU is factory installed. Refer to ordering options.
	Multi-Device Dual Unit (MDDU)	The MDDU allows two separate RET Controllers to independently drive the RETs in Amphenol antennas with factory installed motors (for antenna sharing). The MDDU is factory installed. Refer to ordering options.
Important Installation Instructions	In order to operate RET control, the transparent caps covering the tilt adjustment indicators must be engaged and locked. Do not cut them from the antenna.	
	Do not install the antenna with the connectors facing upward.	

Mounting Options	Part Number	Image	Fits Pipe Diameter	Weight
All mounting bracket kits are ordered separately unless otherwise indicated. Select from the options listed below.				
3-Point Mounting and Downtilt Bracket Kit	36210008		40-115 mm 1.6-4.5 in	6.9 kg 15.2 lbs

Configuration Options
This antenna model **cannot** be used with Amphenol's UNICELL 3-sector antenna enclosures.

QUAD656C0000x

Twin Band | Quad Port | Panel Antenna | (2x) X-Pol | 65° / 65° | 15.0 / 15.0 dBi | Variable Tilt

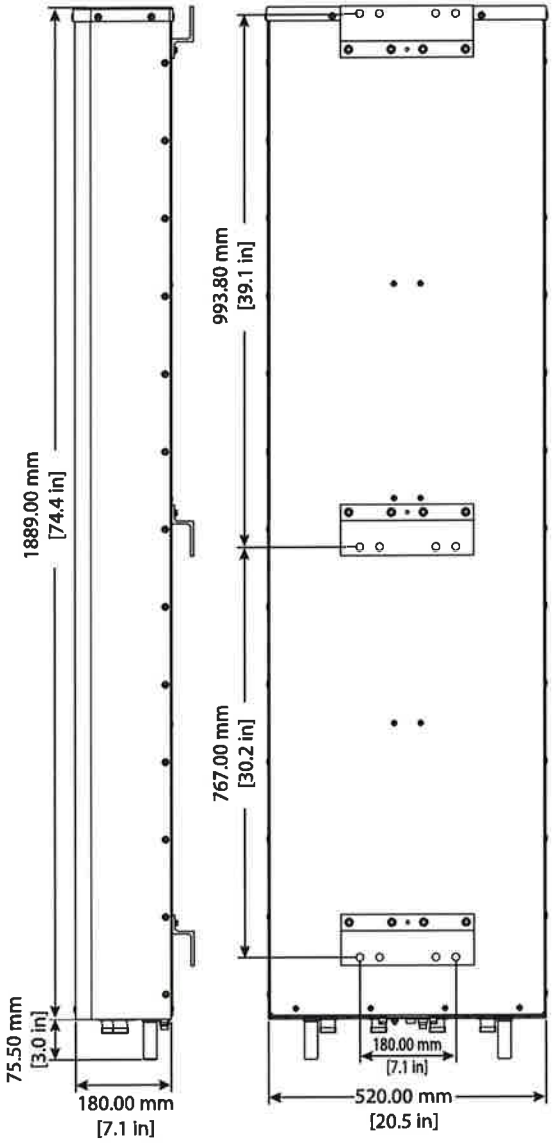
Bottom View of Antenna

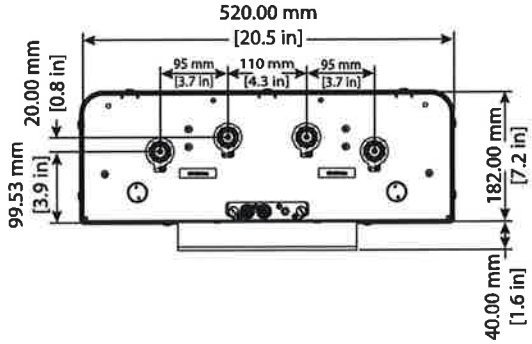
Location of the MDCU or MDDU for RET Control *(MDCU shown)*

Tilt indicators covered by transparent caps.
Manual adjustment is accessed by removing the caps.
Knob colors are the same as the connectors.

In order to operate RET control, the transparent caps covering the tilt adjustment indicators must be engaged and locked. Do not cut them from the antenna.

Dimensions

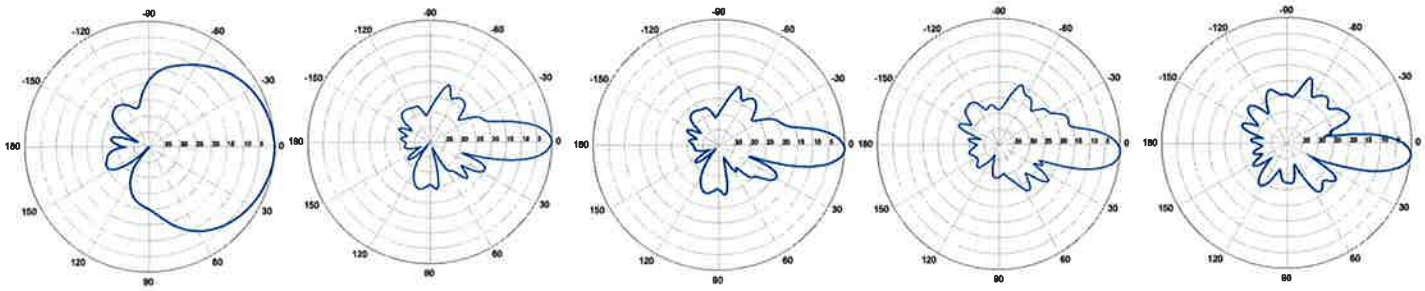




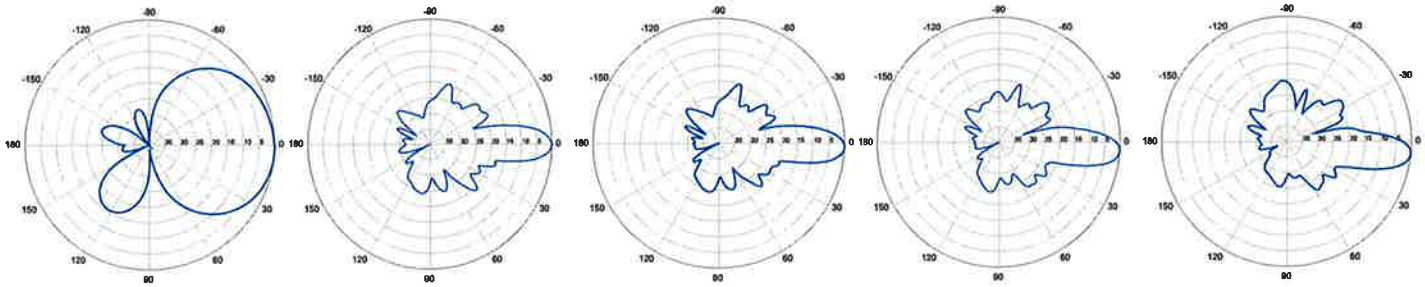
QUAD656C0000x

Twin Band | Quad Port | Panel Antenna | (2x) X-Pol | 65° / 65° | 15.0 / 15.0 dBi | Variable Tilt

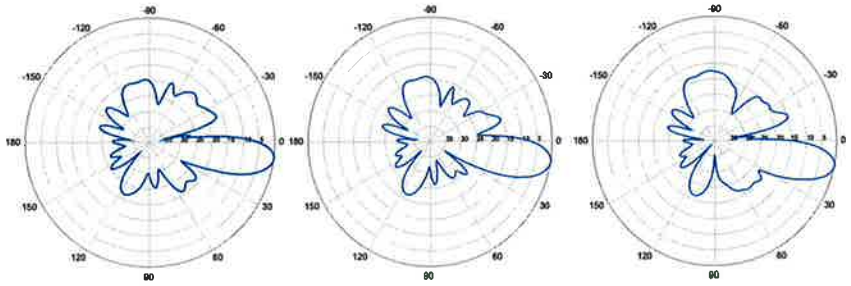
696-900 MHz



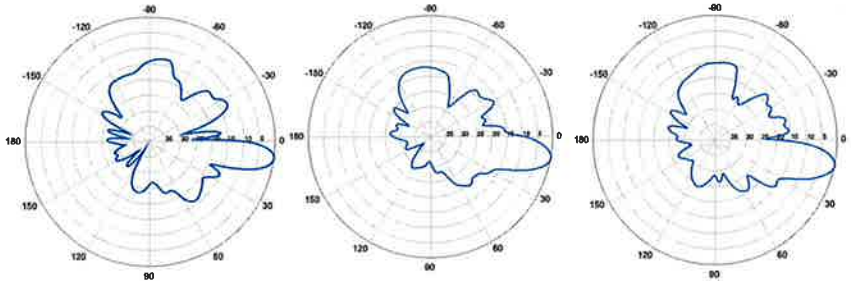
Horizontal | 750 MHz | 0° | Vertical | 750 MHz | 2° | Vertical | 750 MHz | 4° | Vertical | 750 MHz | 6° | Vertical | 750 MHz



Horizontal | 850 MHz | 0° | Vertical | 850 MHz | 2° | Vertical | 850 MHz | 4° | Vertical | 850 MHz | 6° | Vertical | 850 MHz



8° | Vertical | 750 MHz | 10° | Vertical | 750 MHz | 12° | Vertical | 750 MHz



8° | Vertical | 850 MHz | 10° | Vertical | 850 MHz | 12° | Vertical | 850 MHz

ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

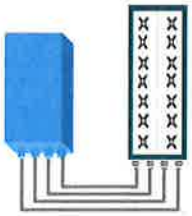
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R
or
2x60W with 2T4R

Can be switched between modes via SW w/o site visit

Alcatel·Lucent

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.) **Volume in L** **Weight in kg (lb) (w/o mounting HW)**	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)
DC voltage range **DC power consumption**	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions **Wind load (@150km/h or 93mph)**	-40°C (-40°F) /+55°C (+131°F) IP65 Frontal:<200N / Lateral :<150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

ALCATEL-LUCENT B66A RRH4X45

The Alcatel-Lucent B66a Remote Radio Head 4x45 is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering. Its operational range covers beyond that of B4 (AWS) and B10 (AWS+).

Supporting 2Tx/4Tx MIMO and 2-way/4-way Rx diversity, the Alcatel-Lucent B66a RRH4x45 allows operators to have a compact radio solution to deploy LTE in the 2100 band (3GPP band 4, 10, and 66), providing them with the means to achieve high capacity, high quality, high reliability, large instantaneous bandwidth, and high coverage with minimum site requirements.

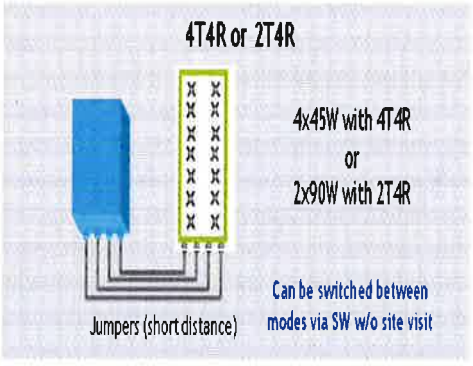
The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.

The Alcatel-Lucent B66a RRH4x45 is a compact (near zero-footprint) solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 2110 - 2180 MHz band/DL, 1710-1780MHz/UL (3GPP band 4, 10, and 66a)
- LTE 2Tx or 4Tx MIMO (SW selectable)
- Configuration: 2T2R/2T4R/4T4R
- Output power: Up to 2x90W or 4x45W (SW configurable)
- 70MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports



BENEFITS

- Compact to reduce additional footprint when adding LTE in AWS 1-3 band
- Selection of MIMO configuration (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through 4Tx MIMO
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall

Features & Performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (in 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme **Receiver Sensivity (FRC A1-3)**	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum
Sizes (HxWxD) in mm (in.) **Volume in Liters** **Weight in kg (lb) (w/o mounting HW)**	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield) 35.5 (with solar shield) 29.7 (without solar shield) 25.8kg (56.8lb) (with solar shield)
DC voltage range **DC power consumption**	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions **Wind load (@150km/h or 93mph)**	-40°C (-40°F) /+55°C (+131°F) UL50E Type 4 Enclosure 250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

ATTACHMENT 2

	General	Power	Density					
Site Name: East Lyme								
Tower Height: 151ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*T-Mobile	2	2334	103	2100	0.1784	1.0000	1.78%	
*T-Mobile	1	865	103	700	0.0331	0.4667	0.71%	
*T-Mobile	2	1167	103	1900	0.0892	1.0000	0.89%	
*T-Mobile	2	1167	103	2100	0.0892	1.0000	0.89%	
*MetroPCS	3	727	134	2140	0.0479	1.0000	0.48%	
*Sprint	3	693	122	1900	0.0556	1.0000	0.56%	
*Sprint	1	390	122	850	0.0104	0.5667	0.18%	
*Sprint	2	693	122	2500	0.0370	1.0000	0.37%	
*Town			155		0.0015	1.0000	0.02%	
Verizon PCS	**1**	**3365**	**149**	**0.0545**	**1970**	**1.0000**	**5.45%**	
Verizon Cellular	**9**	**349**	**149**	**0.0509**	**869**	**0.5793**	**8.78%**	
Verizon AWS	**1**	**8497**	**149**	**0.1376**	**2145**	**1.0000**	**13.76%**	
Verizon 700	**1**	**1566**	**149**	**0.0254**	**746**	**0.4973**	**5.10%**	
								38.97%
* Source: Siting Council								

ATTACHMENT 3

PJF PAUL J. FORD & COMPANY

Date: **October 13, 2016**

Sean Dempsey
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
mbuske@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	117878
	Carrier Site Name:	East Lyme CT
Crown Castle Designation:	**Crown Castle BU Number:**	806384
	Crown Castle Site Name:	NLN 136 943455
	Crown Castle JDE Job Number:	400309
	Crown Castle Work Order Number:	1311985
	Crown Castle Application Number:	364300 Rev. 0
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37516-3357.001.8700
Site Data:	**93 ROXBURY ROAD, EAST LYME, New London County, CT**	
	Latitude *41° 20' 8.35"*, Longitude *-72° 13' 18.28"*	
	151.292 Foot - Self Support Tower	

Dear Sean Dempsey,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 957272, in accordance with application 364300, revision 0.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2015 International Building Code based upon an ultimate 3-second gust wind speed of 133 mph converted to a nominal 3-second gust wind speed of 103 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a topographic category 1 and crest height of 0 feet, and Risk Category II were used in this analysis.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Matthew Buske, E.I.
Structural Designer (THK)

STATE OF CONNECTICUT
JOSEPH PACHECARAH JACOBS
No. PEN 22731
LICENSED
PROFESSIONAL ENGINEER

tnxTower Report - version 7.0.5.1

OCT 14 2016

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 151.292 ft Self Support tower designed by Rohn in March of 1990. The tower was originally designed for a wind speed of 85 mph per EIA-222-D. The tower has been reinforced multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 103 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	149.0	3	alcatel lucent	B13 RRH 4X30	-	-	-
		3	alcatel lucent	B66A RRH4X45			
		3	amphenol	QUAD656C0000X			
		2	rfs celwave	DB-B1-6C-12AB-0Z			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	157.0	1	telewave	ANT150F2	1 1	7/8 1/4	1
	152.0	1	motorola	WB2618			
	150.0	1	tower mounts	Side Arm Mount [SO 304-1]			
148.0	149.0	3	alcatel lucent	RRH 2X40 700 MHz UPPER	-	-	2
		3	alcatel lucent	RRH2X60-AWS			
		3	commscope	LNX-6514DS-AIM			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	alcatel lucent	RRH2X60-PCS	8 6	1 5/8 7/8	1
		6	commscope	HBXX-6517DS-A2M			
		3	commscope	LNX-6514DS-AIM			
	148.0	1	tower mounts	Sector Mount [SM 510-3]			
146.0	146.0	1	panasonic	WV-CW864	2	3/8	1
133.0	134.0	3	kathrein	800 10504	6 1	1 5/8 3/8	1
	133.0	1	tower mounts	Sector Mount [SM 104-3]			
128.0	130.0	1	motorola	SC614	1	7/8	1
		1	til-tek	TA-2450			
	128.0	1	tower mounts	Side Arm Mount [SO 305-1]			
126.0	126.0	1	motorola	WB2618	1	5/16	1
		1	tower mounts	Side Arm Mount [SO 305-1]			
121.0	122.0	3	alcatel lucent	1900MHz RRH (65MHz)	3	1 1/4	1
		3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		1	rfs celwave	APXV9ERR18-C-A20			
		2	rfs celwave	APXVSPP18-C-A20			
	121.0	1	tower mounts	Sector Mount [SM 505-3]			
112.0	112.0	9	decibel	DB844H90E-XY	9	7/8	1
		1	tower mounts	Sector Mount [SM 510-3]			
103.0	103.0	3	commscope	LNX-6515DS-VTM	12 1	1 5/8 1 1/4	1
		3	ericsson	ERICSSON AIR 21 B2A B4P			
		3	ericsson	ERICSSON AIR 21 B4A B2P			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
		1	tower mounts	Sector Mount [SM 701-3]			
95.0	94.0	1	motorola	WB2623	1	5/16	1
90.0	96.0	1	sinclair	SRL-217 Ground Plane 10.67' x 4.83'	1	7/8	1
	90.0	1	tower mounts	Side Arm Mount [SO 302-1]			
83.0	95.0	1	motorola	PTP 49400	1 1	7/8 1/4	1
	90.0	1	telewave	ANT150D3			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
	83.0	1	tower mounts	Side Arm Mount [SO 305-1]			
61.0	61.0	1	bluewave	BW246Y	1	1/4	1
50.0	52.0	1	lucent	KS24019-L112A	1	1/2	1
	50.0	1	tower mounts	Side Arm Mount [SO 305-1]			

Notes:
1) Existing Equipment
2) Equipment to be Removed, Not Considered In Analysis

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings	March 5, 1990, Rohn	24792JC	258359
Foundation Drawings	March 5, 1990, Rohn	24792JC	958525
Geotechnical Report	July 19, 1989, Dr. Clarence Welti	-	258373
Modification Drawings	January 16, 2003, All Points Technology	CT105761	801526
Modification Drawings	February 26, 2008, (Revised July 9, 2008) Vertical Structures	2008-004-030	2215933
Modification Drawings	May 14, 2009, PJF	41709-0057	2457486
Modification Drawings	May 10, 2011, PJF	37511-0187Mod	2883931
Structural Analysis	May 10, 2011, PJF	37511-0187Mod	2883926

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	151.292 - 146.229	Leg	ROHN 2.5 STD	3	-5.22	57.61	9.1	Pass
T2	146.229 - 141.167	Leg	ROHN 2.5 STD	15	-8.17	57.61	14.2	Pass
T3	141.167 - 121.042	Leg	ROHN 2.5 EH	24	-28.74	58.52	49.1	Pass
T4	121.042 - 114.313	Leg	ROHN 2.5 EH (GR)	48	-33.60	64.40	52.2	Pass
T5	114.313 - 107.646	Leg	ROHN 2.5 EH (GR)	57	-44.03	64.40	68.4	Pass
T6	107.646 - 100.917	Leg	ROHN 2.5 EH (GR)	66	-61.01	100.07	61.0	Pass
T7	100.917 - 94.2014	Leg	ROHN 3 EH (GR)	78	-66.51	108.41	61.3	Pass
T8	94.2014 - 87.4861	Leg	ROHN 3 EH (GR)	87	-78.13	145.20	53.8	Pass
T9	87.4861 - 80.7708	Leg	ROHN 3 EH (GR)	99	-97.22	145.63	66.8	Pass
T10	80.7708 - 70.6875	Leg	ROHN 4 EH (GR)	111	-105.95	142.78	74.2	Pass
T11	70.6875 - 60.6041	Leg	ROHN 4 EH (GR)	120	-123.70	212.04	58.3 62.8 (b)	Pass
T12	60.6041 - 50.5104	Leg	ROHN 4 EH (GR)	132	-152.14	213.19	71.4	Pass
T13	50.5104 - 40.4166	Leg	ROHN 4 EH (GR)	144	-170.19	213.29	79.8	Pass
T14	40.4166 - 30.3125	Leg	ROHN 5 EH (GR)	156	-178.86	246.97	72.4	Pass
T15	30.3125 - 20.2083	Leg	ROHN 5 EH (GR)	165	-206.66	320.59	64.5 71.6 (b)	Pass
T16	20.2083 - 10.1041	Leg	ROHN 5 EH (GR)	177	-215.08	320.67	67.1	Pass
T17	10.1041 - 0	Leg	ROHN 5 EH (GR)	189	-242.98	320.73	75.8	Pass
T1	151.292 - 146.229	Diagonal	L 1.5 x 1.5 x 3/16	9	-0.85	3.33	25.5	Pass
T2	146.229 - 141.167	Diagonal	L 2 x 2 x 3/16	19	-2.83	8.15	34.7 38.0 (b)	Pass
T3	141.167 - 121.042	Diagonal	L2 1/2x2 1/2x3/16	30	-3.90	9.73	40.1 61.8 (b)	Pass
T4	121.042 - 114.313	Diagonal	L2 1/2x2 1/2x3/16	51	-4.79	8.85	54.0	Pass
T5	114.313 - 107.646	Diagonal	L2 1/2x2 1/2x3/16	60	-5.63	8.08	69.7	Pass
T6	107.646 - 100.917	Diagonal	2L 2.5 x 2.5 x 3/16 (3/16)	69	-6.96	32.54	21.4 53.8 (b)	Pass
T7	100.917 - 94.2014	Diagonal	L3x3x3/16	81	-7.45	12.09	61.6	Pass
T8	94.2014 - 87.4861	Diagonal	L3x3x3/16	90	-7.95	11.05	71.9	Pass
T9	87.4861 - 80.7708	Diagonal	2L 3 x 3 x 3/16 (1/4)	102	-8.45	41.68	20.3 65.9 (b)	Pass
T10	80.7708 - 70.6875	Diagonal	2L3x3x3/16x1/4	114	-9.53	35.01	27.2 68.5 (b)	Pass
T11	70.6875 - 60.6041	Diagonal	2L3x3x3/16x1/4	123	-10.21	32.74	31.2 69.9 (b)	Pass
T12	60.6041 - 50.5104	Diagonal	2L3x3x1/4x1/4	135	-10.47	40.69	25.7 72.2 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T13	50.5104 - 40.4166	Diagonal	2L3x3x1/4x1/4	147	-10.83	37.20	29.1 44.5 (b)	Pass
T14	40.4166 - 30.3125	Diagonal	2L3 1/2x3 1/2x1/4x1/4	159	-11.07	55.38	20.0 47.2 (b)	Pass
T15	30.3125 - 20.2083	Diagonal	2L3 1/2x3 1/2x1/4x1/4	168	-12.00	51.06	23.5 48.3 (b)	Pass
T16	20.2083 - 10.1041	Diagonal	2L 4 x 4 x 1/4 (1/4)	180	-11.88	68.88	17.2 50.3 (b)	Pass
T17	10.1041 - 0	Diagonal	2L 4 x 4 x 1/4 (1/4)	192	-12.96	64.90	20.0 52.1 (b)	Pass
T6	107.646 - 100.917	Secondary Horizontal	L 2 x 2 x 3/16	74	-0.95	11.30	8.4 13.9 (b)	Pass
T8	94.2014 - 87.4861	Secondary Horizontal	L 2 x 2 x 3/16	95	-1.36	9.54	14.2 19.8 (b)	Pass
T9	87.4861 - 80.7708	Secondary Horizontal	L 2 x 2 x 3/16	107	-1.57	8.66	18.1 22.9 (b)	Pass
T11	70.6875 - 60.6041	Secondary Horizontal	L2 1/2x2 1/2x3/16	128	-2.15	13.36	16.1 27.4 (b)	Pass
T12	60.6041 - 50.5104	Secondary Horizontal	L3x3x1/4	140	-2.47	25.09	9.8 31.0 (b)	Pass
T13	50.5104 - 40.4166	Secondary Horizontal	L3x3x1/4	152	-2.78	23.19	12.0 34.9 (b)	Pass
T15	30.3125 - 20.2083	Secondary Horizontal	L 3 x 3 x 3/16	173	-3.40	15.13	22.5 43.4 (b)	Pass
T16	20.2083 - 10.1041	Secondary Horizontal	L3x3x3/16	185	-3.73	13.88	26.9 47.6 (b)	Pass
T17	10.1041 - 0	Secondary Horizontal	L 3.5 x 3.5 x 1/4	197	-4.02	25.67	15.7 38.5 (b)	Pass
T1	151.292 - 146.229	Top Girt	L2 1/2x2 1/2x3/16	5	-0.16	5.01	3.1	Pass
T3	141.167 - 121.042	Top Girt	L2 1/2x2 1/2x3/16	25	-0.59	5.00	11.7	Pass
							Summary	
						Leg (T13)	79.8	Pass
						Diagonal (T12)	72.2	Pass
						Secondary Horizontal (T16)	47.6	Pass
						Top Girt (T3)	11.7	Pass
						Bolt Checks	72.2	Pass
						Rating =	79.8	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	68.3	Pass
1	Base Foundation Structural	-	54.9	Pass
1	Base Foundation Soil Interaction	-	75.8	Pass

Structure Rating (max from all components) =	79.8%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundations have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

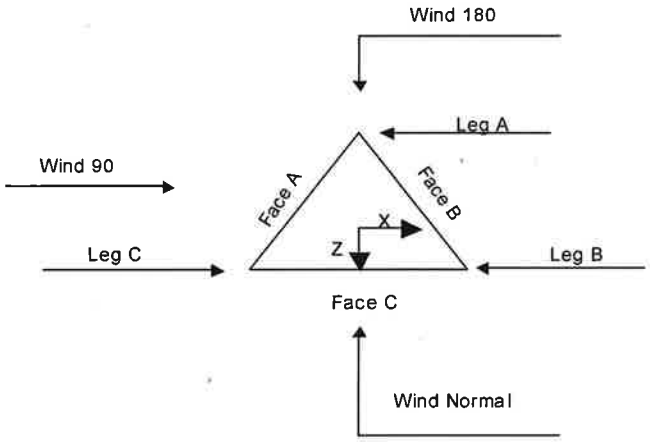
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 151.29 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 8.56 ft at the top and 22.78 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in New London County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 103 mph.
4) Structure Class II.
5) Exposure Category B.
6) Topographic Category 1.
7) Crest Height 0.00 ft.
8) Nominal ice thickness of 0.7500 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56 pcf.
11) A wind speed of 50 mph is used in combination with ice.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Grouted pipe f'_c is 7 ksi.
15) Pressures are calculated at each section.
16) Stress ratio used in tower member design is 1.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	151.29-146.23			8.56	1	5.06
T2	146.23-141.17			8.56	1	5.06
T3	141.17-121.04			8.56	1	20.13
T4	121.04-114.31			10.56	1	6.73
T5	114.31-107.65			11.24	1	6.67
T6	107.65-100.92			11.92	1	6.73
T7	100.92-94.20			12.60	1	6.72
T8	94.20-87.49			13.30	1	6.72
T9	87.49-80.77			14.00	1	6.72
T10	80.77-70.69			14.70	1	10.08
T11	70.69-60.60			15.70	1	10.08
T12	60.60-50.51			16.70	1	10.09
T13	50.51-40.42			17.73	1	10.09
T14	40.42-30.31			18.77	1	10.10
T15	30.31-20.21			19.78	1	10.10
T16	20.21-10.10			20.78	1	10.10
T17	10.10-0.00			21.78	1	10.10

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	151.29-146.23	4.94	X Brace	No	No	0.7500	0.7500
T2	146.23-141.17	4.94	X Brace	No	No	0.7500	0.7500
T3	141.17-121.04	6.67	X Brace	No	No	0.7500	0.7500
T4	121.04-114.31	6.67	X Brace	No	No	0.7500	0.0000
T5	114.31-107.65	6.67	X Brace	No	No	0.0000	0.0000
T6	107.65-100.92	6.67	X Brace	No	Yes	0.0000	0.7500

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T7	100.92-94.20	6.65	X Brace	No	No	0.7500	0.0000
T8	94.20-87.49	6.72	X Brace	No	Yes	0.0000	0.0000
T9	87.49-80.77	6.63	X Brace	No	Yes	0.0000	1.0000
T10	80.77-70.69	10.00	X Brace	No	No	1.0000	0.0000
T11	70.69-60.60	10.08	X Brace	No	Yes	0.0000	0.0000
T12	60.60-50.51	9.91	X Brace	No	Yes	1.0000	1.2500
T13	50.51-40.42	9.91	X Brace	No	Yes	1.0000	1.2500
T14	40.42-30.31	10.00	X Brace	No	No	1.2500	0.0000
T15	30.31-20.21	10.00	X Brace	No	Yes	0.0000	1.2500
T16	20.21-10.10	10.00	X Brace	No	Yes	1.2500	0.0000
T17	10.10-0.00	10.00	X Brace	No	Yes	0.0000	1.2500

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 151.29-146.23	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2 146.23-141.17	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T3 141.17-121.04	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 121.04-114.31	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 114.31-107.65	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 107.65-100.92	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Double Angle	2L 2.5 x 2.5 x 3/16 (3/16)	A36 (36 ksi)
T7 100.92-94.20	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 94.20-87.49	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T9 87.49-80.77	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Double Angle	2L 3 x 3 x 3/16 (1/4)	A36 (36 ksi)
T10 80.77-70.69	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T11 70.69-60.60	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T12 60.60-50.51	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T13 50.51-40.42	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T14 40.42-30.31	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x1/4	A572-50 (50 ksi)
T15 30.31-20.21	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x1/4	A572-50 (50 ksi)
T16 20.21-10.10	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L 4 x 4 x 1/4 (1/4)	A572-50 (50 ksi)
T17 10.10-0.00	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L 4 x 4 x 1/4 (1/4)	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 151.29-146.23	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 141.17-	Single Angle	L2 1/2x2 1/2x3/16	A36	Single Angle		A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
121.04			(36 ksi)			(36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T6 107.65-100.92	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T8 94.20-87.49	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 87.49-80.77	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 70.69-60.60	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T12 60.60-50.51	Single Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 50.51-40.42	Single Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T15 30.31-20.21	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 20.21-10.10	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T17 10.10-0.00	Single Angle	L 3.5 x 3.5 x 1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 151.29-146.23	0.30	0.1875	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T2 146.23-141.17	0.30	0.1875	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T3 141.17-121.04	0.80	0.1875	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T4 121.04-114.31	0.27	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T5 114.31-107.65	0.27	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T6 107.65-100.92	1.25	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T7 100.92-94.20	0.93	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T8 94.20-87.49	0.47	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T9 87.49-80.77	0.47	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T10 80.77-70.69	0.45	0.2500	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T11 70.69-60.60	0.45	0.2500	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T12 60.60-50.51	0.45	0.2500	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T13 50.51-40.42	0.45	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T14 40.42-30.31	0.45	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T15 30.31-20.21	0.45	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T16 20.21-10.10	1.50	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T17 10.10-0.00	1.50	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 151.29-146.23	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 146.23-141.17	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 141.17-121.04	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 121.04-114.31	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 114.31-107.65	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 107.65-100.92	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T7 100.92-94.20	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 94.20-87.49	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T9 87.49-80.77	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T10 80.77-70.69	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 70.69-60.60	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T12 60.60-50.51	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T13 50.51-40.42	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T14 40.42-30.31	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 30.31-20.21	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T16 20.21-10.10	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T17 10.10-0.00	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 151.29-146.23	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 146.23-141.17	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 141.17-121.04	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 121.04-114.31	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 114.31-107.65	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 107.65-100.92	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.92-94.20	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 94.20-87.49	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 87.49-80.77	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80.77-70.69	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 70.69-60.60	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 60.60-50.51	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 50.51-40.42	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40.42-30.31	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 30.31-20.21	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 20.21-10.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 10.10-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top in	Horiz. Top in	Vert. Bot. in	Horiz. Bot. in	Vert. Top in	Horiz. Top in	Vert. Bot. in	Horiz. Bot. in
T1 151.29-146.23	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 146.23-141.17	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 141.17-121.04	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T4 121.04-114.31	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 114.31-107.65	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T6 107.65-100.92	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T7 100.92-94.20	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T8 94.20-87.49	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T9 87.49-80.77	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T10 80.77-70.69	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T11 70.69-60.60	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T12 60.60-50.51	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T13 50.51-40.42	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T14 40.42-30.31	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000
T15 30.31-20.21	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000
T16 20.21-10.10	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000
T17 10.10-0.00	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 151.29-146.23	Flange	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T2 146.23-141.17	Flange	0.6250 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T3 141.17-121.04	Flange	0.6250 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T4 121.04-114.31	Flange	0.7500 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T5 114.31-107.65	Flange	0.7500 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T6 107.65-100.92	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T7 100.92-94.20	Flange	0.8750 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T8 94.20-87.49	Flange	0.8750 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T9 87.49-80.77	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T10 80.77-70.69	Flange	0.8750 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T11 70.69-60.60	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T12 60.60-50.51	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T13 50.51-40.42	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T14 40.42-30.31	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T15 30.31-20.21	Flange	1.0625 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T16 20.21-10.10	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T17 10.10-0.00	Flange	1.0000 A354-BC	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
ROHN 2.5 EH (GR)	50	2.2535	4.2383	16.498	4769	36175	61
ROHN 3 EH (GR)	50	3.0159	6.6052	24.023	4769	37356	63
ROHN 4 EH (GR)	50	4.4074	11.4969	38.949	4769	38952	66
ROHN 5 EH (GR)	50	6.1120	18.1937	58.701	4769	40357	68

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1.5" flat Cable Ladder Rail	B	No	Af (CaAa)	103.00 - 8.00	0.0000	0.45	2	2	1.5000	1.5000		1.80
HB114-1-0813U4-M5J(1 1/4")	B	No	Ar (CaAa)	103.00 - 8.00	0.0000	0.45	1	1	1.5400	1.5400		1.20
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	103.00 - 8.00	0.0000	0.45	12	6	1.0000 0.5000	1.9800		0.82
LDF4P-50A (1/2 FOAM) **	B	No	Ar (CaAa)	50.00 - 8.00	-1.0000	0.49	1	1	0.6300	0.6300		0.15
LDF2-50(3/8")	B	No	Ar (CaAa)	146.00 - 0.00	0.0000	-0.4	2	2	0.4400	0.4400		0.08
LDF1-50A(1/4")	B	No	Ar (CaAa)	61.00 - 0.00	0.0000	-0.4	1	1	0.3450	0.3450		0.06
LDF5-50A(7/8")	B	No	Ar (CaAa)	150.00 - 0.00	0.0000	-0.4	1	1	1.0900	1.0900		0.33
CAT5E(1/4")	B	No	Ar (CaAa)	150.00 - 0.00	0.0000	-0.4	1	1	0.2500	0.2500		0.10
LDF5-50A(7/8")	B	No	Ar (CaAa)	83.00 - 0.00	0.0000	-0.4	1	1	1.0900	1.0900		0.33
CAT5E(1/4") *******	B	No	Ar (CaAa)	83.00 - 0.00	0.0000	-0.4	1	1	0.2500	0.2500		0.10
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	112.00 - 0.00	-1.0000	-0.4	15	9	1.0000 0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	148.00 - 112.00	-1.0000	-0.4	6	6	1.0000 0.5000	1.0900		0.33
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	148.00 - 8.00	2.0000	-0.4	3	2	1.0000 0.5000	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	148.00 - 8.00	2.0000	-0.4	5	3	1.0000 0.5000	1.9800		0.82
HB114-1-08U4-M5J(1 1/4")	B	No	Ar (CaAa)	121.00 - 8.00	-2.0000	-0.4	3	3	1.0000 0.5000	1.5400		1.08
1.5" flat Cable Ladder Rail	B	No	Af (CaAa)	148.00 - 8.00	0.0000	-0.4	2	2	24.0000 0.5000	1.5000		1.80
1.5" flat Cable Ladder Rail **	B	No	Af (CaAa)	121.00 - 8.00	-1.0000	-0.4	1	1	24.0000 1.5000	1.5000		1.80
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	128.00 - 0.00	0.0000	0.45	1	1	1.0900	1.0900		0.33
9207 (5/16")	A	No	Ar (CaAa)	95.00 - 8.00	0.0000	0.4	2	2	0.3300	0.3300		0.06
9207 (5/16")	A	No	Ar (CaAa)	126.00 - 95.00	0.0000	0.4	1	1	0.3300	0.3300		0.06

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
FXL 1873 PE(1 5/8")	A	No	Ar (CaAa)	133.00 - 8.00	0.0000	0.4	6	6	1.0000 0.5000	1.9800		0.01
LDF5-50A(7/8")	A	No	Ar (CaAa)	90.00 - 0.00	0.0000	0.4	1	1	1.0900	1.0900		0.33
FSJ2-50(3/8")	A	No	Ar (CaAa)	133.00 - 0.00	0.0000	0	1	1	0.4250	0.4250		0.08
1.5" flat Cable Ladder Rail	A	No	Af (CaAa)	133.00 - 8.00	0.0000	0.4	2	2	24.0000 1.5000	1.5000		1.80

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Side Arm Mount [SO 304-1]	A	From Leg	1.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.63 1.00 1.37	0.94 1.45 1.96	0.02 0.03 0.04
WB2618	A	From Leg	2.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.04 2.24 2.44	0.53 0.65 0.78	0.01 0.02 0.04
ANT150F2	A	From Leg	2.00 0.00 7.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.29 1.60 1.91	1.29 1.60 1.91	0.01 0.02 0.04
**									
Sector Mount [SM 510-3]	B	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice	40.10 57.33 74.56	40.10 57.33 74.56	2.40 3.09 3.78
LNX-6514DS-AIM w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	8.41 8.97 9.50	7.08 8.27 9.18	0.06 0.13 0.21
LNX-6514DS-AIM w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	8.41 8.97 9.50	7.08 8.27 9.18	0.06 0.13 0.21
LNX-6514DS-AIM w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	8.41 8.97 9.50	7.08 8.27 9.18	0.06 0.13 0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	8.77 9.34 9.89	6.96 8.18 9.14	0.07 0.14 0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	8.77 9.34 9.89	6.96 8.18 9.14	0.07 0.14 0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	8.77 9.34 9.89	6.96 8.18 9.14	0.07 0.14 0.21
RRH2X60-PCS	A	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
RRH2X60-PCS	B	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	C	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
QUAD656C0000X w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
QUAD656C0000X w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
QUAD656C0000X w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
B66A RRH4X45	A	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
B66A RRH4X45	B	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
B66A RRH4X45	C	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
B13 RRH 4X30	A	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	B	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	C	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
DB-B1-6C-12AB-0Z	A	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	3.36 3.60 3.84	2.19 2.39 2.61	0.03 0.06 0.09
DB-B1-6C-12AB-0Z	B	From Leg	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	3.36 3.60 3.84	2.19 2.39 2.61	0.03 0.06 0.09
**									
WV-CW864	A	From Leg	1.00 0.00 0.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	0.80 1.44 2.08	0.80 1.44 2.08	0.01 0.01 0.02
**									
Sector Mount [SM 104-3]	A	None		0.0000	133.00	No Ice 1/2" Ice 1" Ice	30.02 40.48 50.94	30.02 40.48 50.94	0.95 1.40 1.86
800 10504 w/ Mount Pipe	A	From Leg	3.50 3.50	0.0000	133.00	No Ice 1/2"	3.59 4.01	3.18 3.91	0.04 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			Ice	4.42	4.58	0.11
						1" Ice			
800 10504 w/ Mount Pipe	B	From Leg	3.50	0.0000	133.00	No Ice	3.59	3.18	0.04
			3.50			1/2"	4.01	3.91	0.07
			1.00			Ice	4.42	4.58	0.11
						1" Ice			
800 10504 w/ Mount Pipe	C	From Leg	3.50	0.0000	133.00	No Ice	3.59	3.18	0.04
			3.50			1/2"	4.01	3.91	0.07
			1.00			Ice	4.42	4.58	0.11
						1" Ice			
**									
Side Arm Mount [SO 305-1]	C	From Leg	1.50	0.0000	128.00	No Ice	0.94	1.41	0.03
			0.00			1/2"	1.48	2.17	0.04
			0.00			Ice	2.02	2.93	0.06
						1" Ice			
SC614	C	From Leg	4.00	0.0000	128.00	No Ice	0.00	0.00	0.00
			0.00			1/2"	0.00	0.00	0.00
			2.00			Ice	0.00	0.00	0.00
						1" Ice			
TA-2450	C	From Leg	3.00	0.0000	128.00	No Ice	0.84	0.84	0.02
			0.00			1/2"	1.08	1.08	0.02
			2.00			Ice	1.34	1.34	0.03
						1" Ice			
Side Arm Mount [SO 305-1]	A	From Leg	1.50	0.0000	126.00	No Ice	0.94	1.41	0.03
			0.00			1/2"	1.48	2.17	0.04
			0.00			Ice	2.02	2.93	0.06
						1" Ice			
WB2618	A	From Leg	3.00	0.0000	126.00	No Ice	2.04	0.53	0.01
			0.00			1/2"	2.24	0.65	0.02
			0.00			Ice	2.44	0.78	0.04
						1" Ice			
**									
Sector Mount [SM 505-3]	A	None		0.0000	121.00	No Ice	34.86	34.86	1.73
						1/2"	49.79	49.79	2.32
						Ice	64.72	64.72	2.91
						1" Ice			
1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	121.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			1.00			Ice	2.74	2.65	0.11
						1" Ice			
800MHz 2X50W RRH W/FILTER	A	From Leg	4.00	0.0000	121.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			1.00			Ice	2.43	2.29	0.11
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	121.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			1.00			Ice	9.35	9.02	0.23
						1" Ice			
1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	121.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			1.00			Ice	2.74	2.65	0.11
						1" Ice			
800MHz 2X50W RRH W/FILTER	B	From Leg	4.00	0.0000	121.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			1.00			Ice	2.43	2.29	0.11
						1" Ice			
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	121.00	No Ice	8.26	7.47	0.09
			0.00			1/2"	8.82	8.66	0.16
			1.00			Ice	9.35	9.56	0.24
						1" Ice			
1900MHz RRH (65MHz)	C	From Leg	4.00	0.0000	121.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			1.00			Ice	2.74	2.65	0.11
						1" Ice			
800MHz 2X50W RRH	C	From Leg	4.00	0.0000	121.00	No Ice	2.06	1.93	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
W/FILTER			0.00 1.00			1/2" Ice 1" Ice	2.24 2.43	2.11 2.29	0.09 0.11
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
** Sector Mount [SM 510-3]	B	None		0.0000	112.00	No Ice 1/2" Ice 1" Ice	40.10 57.33 74.56	40.10 57.33 74.56	2.40 3.09 3.78
(3) DB844H90E-XY w/Mount Pipe	A	From Face	4.00 0.00 0.00	-16.0000	112.00	No Ice 1/2" Ice 1" Ice	3.58 4.20 4.70	5.28 6.31 7.06	0.04 0.08 0.13
(3) DB844H90E-XY w/Mount Pipe	B	From Face	4.00 0.00 0.00	-16.0000	112.00	No Ice 1/2" Ice 1" Ice	3.58 4.20 4.70	5.28 6.31 7.06	0.04 0.08 0.13
(3) DB844H90E-XY w/Mount Pipe	C	From Face	4.00 0.00 0.00	-16.0000	112.00	No Ice 1/2" Ice 1" Ice	3.58 4.20 4.70	5.28 6.31 7.06	0.04 0.08 0.13
** Sector Mount [SM 701-3]	A	None		0.0000	103.00	No Ice 1/2" Ice 1" Ice	19.73 27.41 35.09	19.73 27.41 35.09	0.82 1.17 1.51
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.42 7.12	0.11 0.17 0.23
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.42 7.12	0.11 0.17 0.23
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.42 7.12	0.11 0.17 0.23
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
**									
3'x2" Pipe Mount	A	From Leg	1.50 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	0.52 0.71 0.90	0.52 0.71 0.90	0.03 0.03 0.04
WB2618	A	From Leg	3.00 0.00 -1.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	2.04 2.24 2.44	0.53 0.65 0.78	0.01 0.02 0.04
******									
Side Arm Mount [SO 302-1]	B	From Leg	2.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	1.67 2.51 3.35	3.27 4.99 6.71	0.06 0.09 0.12
SRL-217 Ground Plane 10.67' x 4.83'	B	From Leg	4.00 0.00 6.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	2.21 3.30 4.41	2.21 3.30 4.41	0.01 0.02 0.05
******									
PTP 49400 w/ Mount Pipe	A	From Leg	4.00 0.00 12.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.93 2.16 2.40	0.87 1.11 1.37	0.02 0.04 0.06
10'x2" Pipe Mount	A	From Leg	3.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	2.00 3.02 4.07	2.00 3.02 4.07	0.07 0.09 0.11
Side Arm Mount [SO 305-1]	A	From Leg	1.50 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.94 1.48 2.02	1.41 2.17 2.93	0.03 0.04 0.06
ANT150D3	A	From Leg	3.00 0.00 7.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.60 2.88 4.16	1.60 2.88 4.16	0.02 0.02 0.03
**									
BW246Y	B	From Face	1.50 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice	1.35 2.73 4.11	0.39 0.88 1.36	0.01 0.02 0.04
**									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Side Arm Mount [SO 305-1]	B	From Leg	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice	0.94 1.48 2.02	1.41 2.17 2.93	0.03 0.04 0.06
KS24019-L112A	B	From Leg	3.00 0.00 2.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice	0.14 0.20 0.26	0.14 0.20 0.26	0.01 0.01 0.01
**									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service

Comb. No.	Description
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	151.292 - 146.229	2.406	39	0.1316	0.0108
T2	146.229 - 141.167	2.269	39	0.1314	0.0106
T3	141.167 - 121.042	2.129	39	0.1304	0.0103
T4	121.042 - 114.313	1.591	39	0.1201	0.0086
T5	114.313 - 107.646	1.421	39	0.1148	0.0078
T6	107.646 - 100.917	1.261	39	0.1083	0.0070
T7	100.917 - 94.2014	1.112	39	0.1006	0.0065
T8	94.2014 - 87.4861	0.967	39	0.0942	0.0057
T9	87.4861 - 80.7708	0.833	39	0.0869	0.0049
T10	80.7708 - 70.6875	0.713	39	0.0786	0.0044
T11	70.6875 - 60.6041	0.547	39	0.0695	0.0037
T12	60.6041 - 50.5104	0.403	39	0.0595	0.0030
T13	50.5104 - 40.4166	0.281	39	0.0485	0.0024
T14	40.4166 - 30.3125	0.185	39	0.0369	0.0019
T15	30.3125 - 20.2083	0.109	39	0.0282	0.0014
T16	20.2083 - 10.1041	0.053	39	0.0192	0.0009
T17	10.1041 - 0	0.014	39	0.0097	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Side Arm Mount [SO 304-1]	39	2.371	0.1316	0.0107	77508
148.00	Sector Mount [SM 510-3]	39	2.317	0.1316	0.0107	77508
146.00	WV-CW864	39	2.263	0.1314	0.0106	78815
133.00	Sector Mount [SM 104-3]	39	1.906	0.1273	0.0096	119015
128.00	Side Arm Mount [SO 305-1]	39	1.772	0.1246	0.0092	101129
126.00	Side Arm Mount [SO 305-1]	39	1.719	0.1234	0.0091	95394
121.00	Sector Mount [SM 505-3]	39	1.589	0.1200	0.0086	90159
112.00	Sector Mount [SM 510-3]	39	1.364	0.1127	0.0075	54060
103.00	Sector Mount [SM 701-3]	39	1.157	0.1029	0.0066	104733
95.00	3'x2" Pipe Mount	39	0.984	0.0949	0.0058	57686
90.00	Side Arm Mount [SO 302-1]	39	0.882	0.0898	0.0051	35852
83.00	PTP 49400 w/ Mount Pipe	39	0.752	0.0813	0.0045	59554
61.00	BW246Y	39	0.408	0.0600	0.0030	62523

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
50.00	Side Arm Mount [SO 305-1]	39	0.275	0.0480	0.0024	42572

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	151.292 - 146.229	11.104	2	0.6043	0.0508
T2	146.229 - 141.167	10.478	2	0.6036	0.0501
T3	141.167 - 121.042	9.835	2	0.5991	0.0484
T4	121.042 - 114.313	7.355	2	0.5525	0.0406
T5	114.313 - 107.646	6.575	2	0.5285	0.0369
T6	107.646 - 100.917	5.833	2	0.4991	0.0329
T7	100.917 - 94.2014	5.149	2	0.4636	0.0306
T8	94.2014 - 87.4861	4.480	2	0.4342	0.0269
T9	87.4861 - 80.7708	3.858	2	0.4009	0.0230
T10	80.7708 - 70.6875	3.303	2	0.3629	0.0208
T11	70.6875 - 60.6041	2.536	2	0.3212	0.0175
T12	60.6041 - 50.5104	1.871	2	0.2752	0.0142
T13	50.5104 - 40.4166	1.305	2	0.2245	0.0115
T14	40.4166 - 30.3125	0.860	2	0.1709	0.0088
T15	30.3125 - 20.2083	0.506	2	0.1307	0.0065
T16	20.2083 - 10.1041	0.248	2	0.0890	0.0042
T17	10.1041 - 0	0.067	2	0.0449	0.0021

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Side Arm Mount [SO 304-1]	2	10.946	0.6043	0.0507	16660
148.00	Sector Mount [SM 510-3]	2	10.699	0.6042	0.0504	16660
146.00	WV-CW864	2	10.450	0.6035	0.0500	16953
133.00	Sector Mount [SM 104-3]	2	8.805	0.5851	0.0455	26410
128.00	Side Arm Mount [SO 305-1]	2	8.189	0.5731	0.0436	22509
126.00	Side Arm Mount [SO 305-1]	2	7.947	0.5676	0.0428	21254
121.00	Sector Mount [SM 505-3]	2	7.350	0.5524	0.0406	20137
112.00	Sector Mount [SM 510-3]	2	6.312	0.5192	0.0354	11798
103.00	Sector Mount [SM 701-3]	2	5.357	0.4743	0.0313	23611
95.00	3'x2" Pipe Mount	2	4.558	0.4377	0.0274	12566
90.00	Side Arm Mount [SO 302-1]	2	4.083	0.4143	0.0243	7770
83.00	PTP 49400 w/ Mount Pipe	2	3.482	0.3750	0.0214	12827
61.00	BW246Y	2	1.895	0.2771	0.0143	13347
50.00	Side Arm Mount [SO 305-1]	2	1.279	0.2217	0.0114	9331

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	151.292	Diagonal	A325N	0.5000	1	0.91	4.69	0.194 ✓	1	Member Block Shear
		Top Girt	A325N	0.5000	1	0.16	7.95	0.020 ✓	1	Bolt Shear
T2	146.229	Leg	A325N	0.6250	4	1.21	20.71	0.058 ✓	1	Bolt Tension
		Diagonal	A325X	0.5000	1	2.75	7.25	0.380 ✓	1	Member Block Shear
T3	141.167	Leg	A325N	0.6250	4	5.66	20.71	0.274 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3.83	6.20	0.618 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.69	6.20	0.111 ✓	1	Member Bearing
T4	121.042	Diagonal	A325N	0.5000	2	2.37	6.53	0.363 ✓	1	Member Block Shear
T5	114.313	Diagonal	A325N	0.5000	2	2.77	6.53	0.424 ✓	1	Member Block Shear
T6	107.646	Leg	A325N	0.7500	4	11.76	29.82	0.394 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	6.67	12.40	0.538 ✓	1	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	0.95	6.83	0.139 ✓	1	Member Block Shear
T7	100.917	Diagonal	A325N	0.5000	2	3.77	7.03	0.536 ✓	1	Member Block Shear
T8	94.2014	Diagonal	A325N	0.5000	2	3.81	7.03	0.542 ✓	1	Member Block Shear
		Secondary Horizontal	A325N	0.6250	1	1.36	6.83	0.198 ✓	1	Member Block Shear
T9	87.4861	Leg	A325N	0.8750	4	19.74	40.59	0.486 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	8.17	12.40	0.659 ✓	1	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	1.57	6.83	0.229 ✓	1	Member Block Shear
T10	80.7708	Diagonal	A325N	0.6250	1	9.53	13.92	0.685 ✓	1	Gusset Bearing
T11	70.6875	Leg	A325N	0.8750	4	25.49	40.59	0.628 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	9.73	13.92	0.699 ✓	1	Gusset Bearing
		Secondary Horizontal	A325N	0.6250	1	2.15	7.83	0.274 ✓	1	Member Bearing
T12	60.6041	Diagonal	A325N	0.6250	1	10.05	13.92	0.722 ✓	1	Gusset Bearing
		Secondary Horizontal	A325N	0.5000	1	2.47	7.95	0.310 ✓	1	Bolt Shear
T13	50.5104	Leg	A325N	1.0000	4	35.38	53.01	0.667 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	10.40	23.40	0.445 ✓	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	1	2.78	7.95	0.349 ✓	1	Bolt Shear
T14	40.4166	Diagonal	A325N	0.6250	1	11.04	23.40	0.472 ✓	1	Member Bearing
T15	30.3125	Leg	A325N	1.0625	4	42.86	59.85	0.716 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	12.00	24.85	0.483 ✓	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3.40	7.83	0.434 ✓	1	Member Bearing
T16	20.2083	Diagonal	A325N	0.6250	1	11.77	23.40	0.503 ✓	1	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	3.73	7.83	0.476 ✓	1	Member Bearing
T17	10.1041	Leg	A354-BC	1.0000	6	33.39	55.22	0.605 ✓	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.6250	1	12.96	24.85	0.521 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	4.02	10.44	0.385 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $P_u / \phi P_n$
T1	151.292 - 146.229	ROHN 2.5 STD	5.06	4.94	62.5 K=1.00	1.7040	-5.22	57.61	0.091 [1] ✔
T2	146.229 - 141.167	ROHN 2.5 STD	5.06	4.94	62.5 K=1.00	1.7040	-8.17	57.61	0.142 [1] ✔
T3	141.167 - 121.042	ROHN 2.5 EH	20.16	6.68	86.7 K=1.00	2.2535	-28.74	58.52	0.491 [1] ✔
T4	121.042 - 114.313	ROHN 2.5 EH (GR)	6.74	6.68	86.7 K=1.00	2.2535	-33.60	64.40	0.522 [1] ✔
T5	114.313 - 107.646	ROHN 2.5 EH (GR)	6.68	6.68	86.7 K=1.00	2.2535	-44.03	64.40	0.684 [1] ✔
T6	107.646 - 100.917	ROHN 2.5 EH (GR)	6.74	3.43	44.6 K=1.00	2.2535	-61.01	100.07	0.610 [1] ✔
T7	100.917 - 94.2014	ROHN 3 EH (GR)	6.73	6.66	70.4 K=1.00	3.0159	-66.51	108.41	0.613 [1] ✔
T8	94.2014 - 87.4861	ROHN 3 EH (GR)	6.73	3.45	36.4 K=1.00	3.0159	-78.13	145.20	0.538 [1] ✔
T9	87.4861 - 80.7708	ROHN 3 EH (GR)	6.73	3.40	35.9 K=1.00	3.0159	-97.22	145.63	0.668 [1] ✔
T10	80.7708 - 70.6875	ROHN 4 EH (GR)	10.10	10.02	81.4 K=1.00	4.4074	-105.95	142.78	0.742 [1] ✔
T11	70.6875 - 60.6041	ROHN 4 EH (GR)	10.10	5.21	42.3 K=1.00	4.4074	-123.70	212.04	0.583 [1] ✔
T12	60.6041 - 50.5104	ROHN 4 EH (GR)	10.11	5.11	41.5 K=1.00	4.4074	-152.14	213.19	0.714 [1] ✔
T13	50.5104 - 40.4166	ROHN 4 EH (GR)	10.11	5.10	41.4 K=1.00	4.4074	-170.19	213.29	0.798 [1] ✔
T14	40.4166 - 30.3125	ROHN 5 EH (GR)	10.12	10.02	65.4 K=1.00	6.1120	-178.86	246.97	0.724 [1] ✔
T15	30.3125 - 20.2083	ROHN 5 EH (GR)	10.12	5.13	33.5 K=1.00	6.1120	-206.66	320.59	0.645 [1] ✔
T16	20.2083 - 10.1041	ROHN 5 EH (GR)	10.12	5.12	33.4 K=1.00	6.1120	-215.08	320.67	0.671 [1] ✔
T17	10.1041 - 0	ROHN 5 EH (GR)	10.12	5.12	33.4 K=1.00	6.1120	-242.98	320.73	0.758 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	L 1.5 x 1.5 x 3/16	9.24	4.62	189.1 K=1.00	0.5273	-0.85	3.33	0.255 [1] ✓
T2	146.229 - 141.167	L 2 x 2 x 3/16	9.24	4.62	140.8 K=1.00	0.7150	-2.83	8.15	0.347 [1] ✓
T3	141.167 - 121.042	L2 1/2x2 1/2x3/16	11.56	5.97	144.7 K=1.00	0.9020	-3.90	9.73	0.401 [1] ✓
T4	121.042 - 114.313	L2 1/2x2 1/2x3/16	12.14	6.26	151.7 K=1.00	0.9020	-4.79	8.85	0.540 [1] ✓
T5	114.313 - 107.646	L2 1/2x2 1/2x3/16	12.73	6.55	158.8 K=1.00	0.9020	-5.63	8.08	0.697 [1] ✓
T6	107.646 - 100.917	2L 2.5 x 2.5 x 3/16 (3/16)	13.32	6.84	105.5 K=1.00	1.8047	-6.96	32.54	0.214 [1] ✓
T7	100.917 - 94.2014	L3x3x3/16	13.81	7.09	142.7 K=1.00	1.0900	-7.45	12.09	0.616 [1] ✓
T8	94.2014 - 87.4861	L3x3x3/16	14.46	7.41	149.3 K=1.00	1.0900	-7.95	11.05	0.719 [1] ✓
T9	87.4861 - 80.7708	2L 3 x 3 x 3/16 (1/4)	15.05	7.71	98.4 K=1.00	2.1797	-8.45	41.68	0.203 [1] ✓
T10	80.7708 - 70.6875	2L3x3x3/16x1/4	17.36	8.97	114.5 K=1.00	2.1797	-9.53	35.01	0.272 [1] ✓
T11	70.6875 - 60.6041	2L3x3x3/16x1/4	18.25	9.41	120.2 K=1.00	2.1797	-10.21	32.74	0.312 [1] ✓
T12	60.6041 - 50.5104	2L3x3x1/4x1/4	19.03	9.80	126.3 K=1.00	2.8750	-10.47	40.69	0.257 [1] ✓
T13	50.5104 - 40.4166	2L3x3x1/4x1/4	19.93	10.24	132.1 K=1.00	2.8750	-10.83	37.20	0.291 [1] ✓
T14	40.4166 - 30.3125	2L3 1/2x3 1/2x1/4x1/4	20.81	10.67	117.3 K=1.00	3.3750	-11.07	55.38	0.200 [1] ✓
T15	30.3125 - 20.2083	2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	122.2 K=1.00	3.3750	-12.00	51.06	0.235 [1] ✓
T16	20.2083 - 10.1041	2L 4 x 4 x 1/4 (1/4)	22.61	11.57	110.8 K=1.00	3.8750	-11.88	68.88	0.172 [1] ✓
T17	10.1041 - 0	2L 4 x 4 x 1/4 (1/4)	23.51	12.01	115.1 K=1.00	3.8750	-12.96	64.90	0.200 [1] ✓

[1] $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	107.646 - 100.917	L 2 x 2 x 3/16	12.25	12.01	116.8 K=0.50	0.7150	-0.95	11.30	0.084 [1] ✓
T8	94.2014 - 87.4861	L 2 x 2 x 3/16	13.64	13.35	129.8 K=0.50	0.7150	-1.36	9.54	0.142 [1] ✓
T9	87.4861 - 80.7708	L 2 x 2 x 3/16	14.34	14.04	136.6 K=0.50	0.7150	-1.57	8.66	0.181 [1] ✓
T11	70.6875 - 60.6041	L2 1/2x2 1/2x3/16	16.18	15.81	121.9 K=0.50	0.9020	-2.15	13.36	0.161 [1] ✓
T12	60.6041 - 50.5104	L3x3x1/4	17.20	16.82	108.5 K=0.50	1.4400	-2.47	25.09	0.098 [1] ✓
T13	50.5104 - 40.4166	L3x3x1/4	18.24	17.86	115.2 K=0.50	1.4400	-2.78	23.19	0.120 [1] ✓
T15	30.3125 - 20.2083	L 3 x 3 x 3/16	20.26	19.80	126.5 K=0.50	1.0898	-3.40	15.13	0.225 [1] ✓
T16	20.2083 -	L3x3x3/16	21.27	20.81	133.0	1.0900	-3.73	13.88	0.269 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	10.1041				K=0.50				✔
T17	10.1041 - 0	L 3.5 x 3.5 x 1/4	22.27	21.80	119.9	1.6900	-4.02	25.67	0.157 [1]
					K=0.50				✔

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	L2 1/2x2 1/2x3/16	8.56	8.32	201.8	0.9020	-0.16	5.01	0.031 [1]
		KL/R > 200 (C) - 5			K=1.00				✔
T3	141.167 - 121.042	L2 1/2x2 1/2x3/16	8.57	8.33	201.9	0.9020	-0.59	5.00	0.117 [1]
		KL/R > 200 (C) - 25			K=1.00				✔

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	ROHN 2.5 STD	5.06	4.94	62.5	1.7040	0.44	76.68	0.006 [1] ✔
T2	146.229 - 141.167	ROHN 2.5 STD	5.06	4.94	62.5	1.7040	4.83	76.68	0.063 [1] ✔
T3	141.167 - 121.042	ROHN 2.5 EH	20.16	6.68	86.7	2.2535	22.66	101.41	0.223 [1] ✔
T4	121.042 - 114.313	ROHN 2.5 EH (GR)	6.74	6.68	86.7	2.2535	25.43	101.41	0.251 [1] ✔
T5	114.313 - 107.646	ROHN 2.5 EH (GR)	6.68	6.68	86.7	2.2535	33.86	101.41	0.334 [1] ✔
T6	107.646 - 100.917	ROHN 2.5 EH (GR)	6.74	3.43	44.6	2.2535	47.05	101.41	0.464 [1] ✔
T7	100.917 - 94.2014	ROHN 3 EH (GR)	6.73	6.66	70.4	3.0159	51.77	135.72	0.381 [1] ✔
T8	94.2014 - 87.4861	ROHN 3 EH (GR)	6.73	3.45	36.4	3.0159	62.36	135.72	0.460 [1] ✔
T9	87.4861 - 80.7708	ROHN 3 EH (GR)	6.73	3.40	35.9	3.0159	78.97	135.72	0.582 [1] ✔
T10	80.7708 - 70.6875	ROHN 4 EH (GR)	10.10	10.02	81.4	4.4074	86.40	198.34	0.436 [1] ✔
T11	70.6875 - 60.6041	ROHN 4 EH (GR)	10.10	5.21	42.3	4.4074	102.08	198.34	0.515 [1] ✔
T12	60.6041 - 50.5104	ROHN 4 EH (GR)	10.11	5.11	41.5	4.4074	126.37	198.34	0.637 [1] ✔
T13	50.5104 -	ROHN 4 EH (GR)	10.11	5.10	41.4	4.4074	141.52	198.34	0.714 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	40.4166								✓
T14	40.4166 - 30.3125	ROHN 5 EH (GR)	10.12	10.02	65.4	6.1120	148.51	275.04	0.540 [1] ✓
T15	30.3125 - 20.2083	ROHN 5 EH (GR)	10.12	5.13	33.5	6.1120	171.45	275.04	0.623 [1] ✓
T16	20.2083 - 10.1041	ROHN 5 EH (GR)	10.12	5.12	33.4	6.1120	177.99	275.04	0.647 [1] ✓
T17	10.1041 - 0	ROHN 5 EH (GR)	10.12	5.12	33.4	6.1120	200.34	275.04	0.728 [1] ✓

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	L 1.5 x 1.5 x 3/16	9.24	4.62	121.4	0.3076	0.91	13.38	0.068 [1] ✓
T2	146.229 - 141.167	L 2 x 2 x 3/16	9.24	4.62	89.9	0.4484	2.75	19.50	0.141 [1] ✓
T3	141.167 - 121.042	L2 1/2x2 1/2x3/16	11.56	5.97	92.1	0.5886	3.83	25.60	0.150 [1] ✓
T4	121.042 - 114.313	L2 1/2x2 1/2x3/16	12.14	6.26	96.5	0.5886	4.74	25.60	0.185 [1] ✓
T5	114.313 - 107.646	L2 1/2x2 1/2x3/16	12.73	6.55	101.0	0.5886	5.54	25.60	0.216 [1] ✓
T6	107.646 - 100.917	2L 2.5 x 2.5 x 3/16 (3/16)	13.32	6.84	105.5	1.1777	6.67	51.23	0.130 [1] ✓
T7	100.917 - 94.2014	L3x3x3/16	13.81	7.09	90.6	0.7296	7.54	31.74	0.238 [1] ✓
T8	94.2014 - 87.4861	L3x3x3/16	14.46	7.41	94.7	0.7296	7.62	31.74	0.240 [1] ✓
T9	87.4861 - 80.7708	2L 3 x 3 x 3/16 (1/4)	15.05	7.71	98.4	1.4590	8.17	63.47	0.129 [1] ✓
T10	80.7708 - 70.6875	2L3x3x3/16x1/4	17.36	8.97	114.5	1.4238	9.53	61.94	0.154 [1] ✓
T11	70.6875 - 60.6041	2L3x3x3/16x1/4	18.25	9.41	120.2	1.4238	9.73	61.94	0.157 [1] ✓
T12	60.6041 - 50.5104	2L3x3x1/4x1/4	19.03	9.80	126.3	1.8750	10.05	91.41	0.110 [1] ✓
T13	50.5104 - 40.4166	2L3x3x1/4x1/4	19.93	10.24	132.1	1.8750	10.40	91.41	0.114 [1] ✓
T14	40.4166 - 30.3125	2L3 1/2x3 1/2x1/4x1/4	20.81	10.67	117.3	2.2500	11.04	109.69	0.101 [1] ✓
T15	30.3125 - 20.2083	2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	122.2	2.2500	11.18	109.69	0.102 [1] ✓
T16	20.2083 - 10.1041	2L 4 x 4 x 1/4 (1/4)	22.61	11.57	110.8	2.6250	11.77	127.97	0.092 [1] ✓
T17	10.1041 - 0	2L 4 x 4 x 1/4 (1/4)	23.51	12.01	115.1	2.6250	11.75	127.97	0.092 [1] ✓

[1] $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	107.646 - 100.917	L 2 x 2 x 3/16	12.25	12.01	233.6	0.4308	0.95	18.74	0.051 [1] ✔
T8	94.2014 - 87.4861	L 2 x 2 x 3/16	13.64	13.35	259.7	0.4308	1.36	18.74	0.072 [1] ✔
T9	87.4861 - 80.7708	L 2 x 2 x 3/16	14.34	14.04	273.2	0.4308	1.57	18.74	0.084 [1] ✔
T11	70.6875 - 60.6041	L2 1/2x2 1/2x3/16	16.18	15.81	243.8	0.5710	2.15	24.84	0.086 [1] ✔
T12	60.6041 - 50.5104	L3x3x1/4	17.20	16.82	217.1	0.9628	2.47	41.88	0.059 [1] ✔
T13	50.5104 - 40.4166	L3x3x1/4	18.24	17.86	230.5	0.9628	2.78	41.88	0.066 [1] ✔
T15	30.3125 - 20.2083	L 3 x 3 x 3/16	20.26	19.80	252.9	0.7119	3.40	30.97	0.110 [1] ✔
T16	20.2083 - 10.1041	L3x3x3/16	21.27	20.81	266.0	0.7120	3.73	30.97	0.120 [1] ✔
T17	10.1041 - 0	L 3.5 x 3.5 x 1/4	22.27	21.80	239.9	1.1269	4.02	49.02	0.082 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	L2 1/2x2 1/2x3/16	8.56	8.32	128.4	0.5886	0.07	25.60	0.003 [1] ✔
T3	141.167 - 121.042	L2 1/2x2 1/2x3/16	8.57	8.33	128.5	0.5886	0.69	25.60	0.027 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

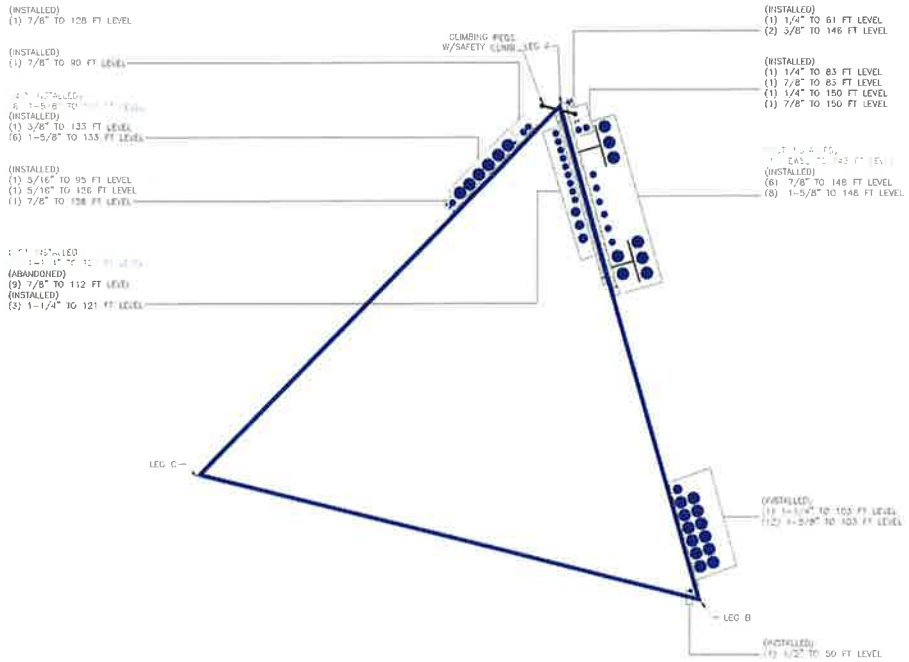
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	151.292 - 146.229	Leg	ROHN 2.5 STD	3	-5.22	57.61	9.1	Pass
T2	146.229 - 141.167	Leg	ROHN 2.5 STD	15	-8.17	57.61	14.2	Pass
T3	141.167 - 121.042	Leg	ROHN 2.5 EH	24	-28.74	58.52	49.1	Pass
T4	121.042 - 114.313	Leg	ROHN 2.5 EH (GR)	48	-33.60	64.40	52.2	Pass
T5	114.313 - 107.646	Leg	ROHN 2.5 EH (GR)	57	-44.03	64.40	68.4	Pass
T6	107.646 - 100.917	Leg	ROHN 2.5 EH (GR)	66	-61.01	100.07	61.0	Pass
T7	100.917 - 94.2014	Leg	ROHN 3 EH (GR)	78	-66.51	108.41	61.3	Pass
T8	94.2014 - 87.4861	Leg	ROHN 3 EH (GR)	87	-78.13	145.20	53.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	87.4861 - 80.7708	Leg	ROHN 3 EH (GR)	99	-97.22	145.63	66.8	Pass
T10	80.7708 - 70.6875	Leg	ROHN 4 EH (GR)	111	-105.95	142.78	74.2	Pass
T11	70.6875 - 60.6041	Leg	ROHN 4 EH (GR)	120	-123.70	212.04	58.3 62.8 (b)	Pass
T12	60.6041 - 50.5104	Leg	ROHN 4 EH (GR)	132	-152.14	213.19	71.4	Pass
T13	50.5104 - 40.4166	Leg	ROHN 4 EH (GR)	144	-170.19	213.29	79.8	Pass
T14	40.4166 - 30.3125	Leg	ROHN 5 EH (GR)	156	-178.86	246.97	72.4	Pass
T15	30.3125 - 20.2083	Leg	ROHN 5 EH (GR)	165	-206.66	320.59	64.5 71.6 (b)	Pass
T16	20.2083 - 10.1041	Leg	ROHN 5 EH (GR)	177	-215.08	320.67	67.1	Pass
T17	10.1041 - 0	Leg	ROHN 5 EH (GR)	189	-242.98	320.73	75.8	Pass
T1	151.292 - 146.229	Diagonal	L 1.5 x 1.5 x 3/16	9	-0.85	3.33	25.5	Pass
T2	146.229 - 141.167	Diagonal	L 2 x 2 x 3/16	19	-2.83	8.15	34.7 38.0 (b)	Pass
T3	141.167 - 121.042	Diagonal	L2 1/2x2 1/2x3/16	30	-3.90	9.73	40.1 61.8 (b)	Pass
T4	121.042 - 114.313	Diagonal	L2 1/2x2 1/2x3/16	51	-4.79	8.85	54.0	Pass
T5	114.313 - 107.646	Diagonal	L2 1/2x2 1/2x3/16	60	-5.63	8.08	69.7	Pass
T6	107.646 - 100.917	Diagonal	2L 2.5 x 2.5 x 3/16 (3/16)	69	-6.96	32.54	21.4 53.8 (b)	Pass
T7	100.917 - 94.2014	Diagonal	L3x3x3/16	81	-7.45	12.09	61.6	Pass
T8	94.2014 - 87.4861	Diagonal	L3x3x3/16	90	-7.95	11.05	71.9	Pass
T9	87.4861 - 80.7708	Diagonal	2L 3 x 3 x 3/16 (1/4)	102	-8.45	41.68	20.3 65.9 (b)	Pass
T10	80.7708 - 70.6875	Diagonal	2L3x3x3/16x1/4	114	-9.53	35.01	27.2 68.5 (b)	Pass
T11	70.6875 - 60.6041	Diagonal	2L3x3x3/16x1/4	123	-10.21	32.74	31.2 69.9 (b)	Pass
T12	60.6041 - 50.5104	Diagonal	2L3x3x1/4x1/4	135	-10.47	40.69	25.7 72.2 (b)	Pass
T13	50.5104 - 40.4166	Diagonal	2L3x3x1/4x1/4	147	-10.83	37.20	29.1 44.5 (b)	Pass
T14	40.4166 - 30.3125	Diagonal	2L3 1/2x3 1/2x1/4x1/4	159	-11.07	55.38	20.0 47.2 (b)	Pass
T15	30.3125 - 20.2083	Diagonal	2L3 1/2x3 1/2x1/4x1/4	168	-12.00	51.06	23.5 48.3 (b)	Pass
T16	20.2083 - 10.1041	Diagonal	2L 4 x 4 x 1/4 (1/4)	180	-11.88	68.88	17.2 50.3 (b)	Pass
T17	10.1041 - 0	Diagonal	2L 4 x 4 x 1/4 (1/4)	192	-12.96	64.90	20.0 52.1 (b)	Pass
T6	107.646 - 100.917	Secondary Horizontal	L 2 x 2 x 3/16	74	-0.95	11.30	8.4 13.9 (b)	Pass
T8	94.2014 - 87.4861	Secondary Horizontal	L 2 x 2 x 3/16	95	-1.36	9.54	14.2 19.8 (b)	Pass
T9	87.4861 - 80.7708	Secondary Horizontal	L 2 x 2 x 3/16	107	-1.57	8.66	18.1 22.9 (b)	Pass
T11	70.6875 - 60.6041	Secondary Horizontal	L2 1/2x2 1/2x3/16	128	-2.15	13.36	16.1 27.4 (b)	Pass
T12	60.6041 - 50.5104	Secondary Horizontal	L3x3x1/4	140	-2.47	25.09	9.8 31.0 (b)	Pass
T13	50.5104 - 40.4166	Secondary Horizontal	L3x3x1/4	152	-2.78	23.19	12.0 34.9 (b)	Pass
T15	30.3125 - 20.2083	Secondary Horizontal	L 3 x 3 x 3/16	173	-3.40	15.13	22.5 43.4 (b)	Pass
T16	20.2083 - 10.1041	Secondary Horizontal	L3x3x3/16	185	-3.73	13.88	26.9 47.6 (b)	Pass
T17	10.1041 - 0	Secondary Horizontal	L 3.5 x 3.5 x 1/4	197	-4.02	25.67	15.7 38.5 (b)	Pass
T1	151.292 -	Top Girt	L2 1/2x2 1/2x3/16	5	-0.16	5.01	3.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T3	146.229 141.167 - 121.042	Top Girt	L2 1/2x2 1/2x3/16	25	-0.59	5.00	11.7	Pass
							Summary	
						Leg (T13)	79.8	Pass
						Diagonal (T12)	72.2	Pass
						Secondary Horizontal (T16)	47.6	Pass
						Top Girt (T3)	11.7	Pass
						Bolt Checks	72.2	Pass
						RATING =	**79.8**	**Pass**

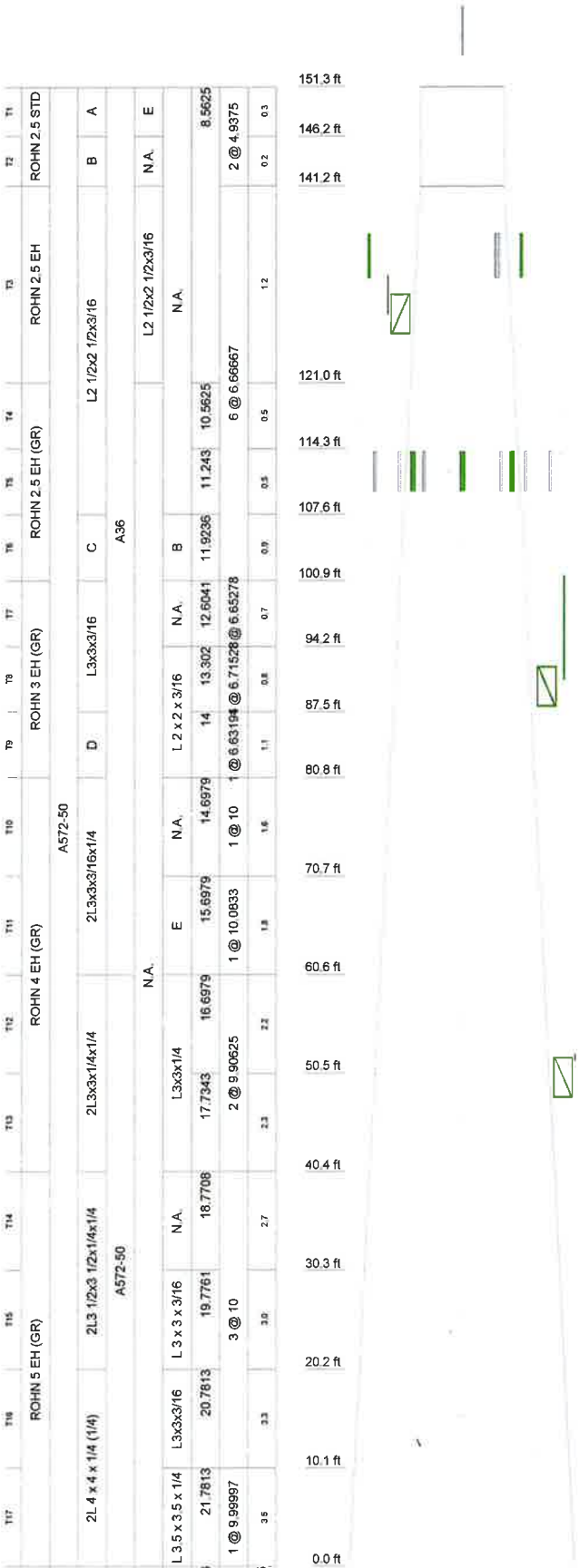
APPENDIX B

BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Side Arm Mount [SO 304-1]	150	1900MHz RRH (65MHz)	121
WB2618	150	800MHz 2X50W RRH W/FILTER	121
ANT150F2	150	APXVSPP18-C-A20 w/ Mount Pipe	121
Sector Mount [SM 510-3]	148	Sector Mount [SM 510-3]	112
LNX-6514DS-AIM w/ Mount Pipe	148	(3) DB844H90E-XY w/Mount Pipe	112
LNX-6514DS-AIM w/ Mount Pipe	148	(3) DB844H90E-XY w/Mount Pipe	112
LNX-6514DS-AIM w/ Mount Pipe	148	(3) DB844H90E-XY w/Mount Pipe	112
(2) HBXX-6517DS-A2M w/ Mount Pipe	148	Sector Mount [SM 701-3]	103
(2) HBXX-6517DS-A2M w/ Mount Pipe	148	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	103
(2) HBXX-6517DS-A2M w/ Mount Pipe	148		
RRH2X60-PCS	148	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	103
RRH2X60-PCS	148		
RRH2X60-PCS	148	KRY 112 144/1	103
QUAD656C0000X w/ Mount Pipe	148	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	103
QUAD656C0000X w/ Mount Pipe	148		
QUAD656C0000X w/ Mount Pipe	148	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	103
B66A RRH4X45	148	KRY 112 144/1	103
B66A RRH4X45	148	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	103
B66A RRH4X45	148		
B13 RRH 4X30	148	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	103
B13 RRH 4X30	148		
B13 RRH 4X30	148	KRY 112 144/1	103
DB-B1-6C-12AB-0Z	148	LNX-6515DS-VTM w/ Mount Pipe	103
DB-B1-6C-12AB-0Z	148	RRUS 11 B12	103
WV-CW864	146	LNX-6515DS-VTM w/ Mount Pipe	103
Sector Mount [SM 104-3]	133	RRUS 11 B12	103
800 10504 w/ Mount Pipe	133	LNX-6515DS-VTM w/ Mount Pipe	103
800 10504 w/ Mount Pipe	133	RRUS 11 B12	103
800 10504 w/ Mount Pipe	133	3'x2" Pipe Mount	95
Side Arm Mount [SO 305-1]	128	WB2618	95
SC614	128	Side Arm Mount [SO 302-1]	90
TA-2450	128	SRL-217 Ground Plane 10.67' x 4.83'	90
Side Arm Mount [SO 305-1]	126	PTP 49400 w/ Mount Pipe	83
WB2618	126	10'x2" Pipe Mount	83
Sector Mount [SM 505-3]	121	Side Arm Mount [SO 305-1]	83
1900MHz RRH (65MHz)	121	ANT150D3	83
800MHz 2X50W RRH W/FILTER	121	BW246Y	61
APXVSPP18-C-A20 w/ Mount Pipe	121	Side Arm Mount [SO 305-1]	50
1900MHz RRH (65MHz)	121	KS24019-L112A	50
800MHz 2X50W RRH W/FILTER	121		
APXV9ERR18-C-A20 w/ Mount Pipe	121		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L 1.5 x 1.5 x 3/16	D	2L 3 x 3 x 3/16 (1/4)
B	L 2 x 2 x 3/16	E	L2 1/2x2 1/2x3/16
C	2L 2.5 x 2.5 x 3/16 (3/16)		

ALL P
ARE

MATERIAL STRENGTH

MAX.
DC
SH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

UPLIFT: -199 K
SH
B: 27 K
AL
140 K

SHEAR
13 K

MOMENT
1374 kip-ft

TORQUE 10 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL
52 K

SHEAR
51 K

MOMENT
4422 kip-ft

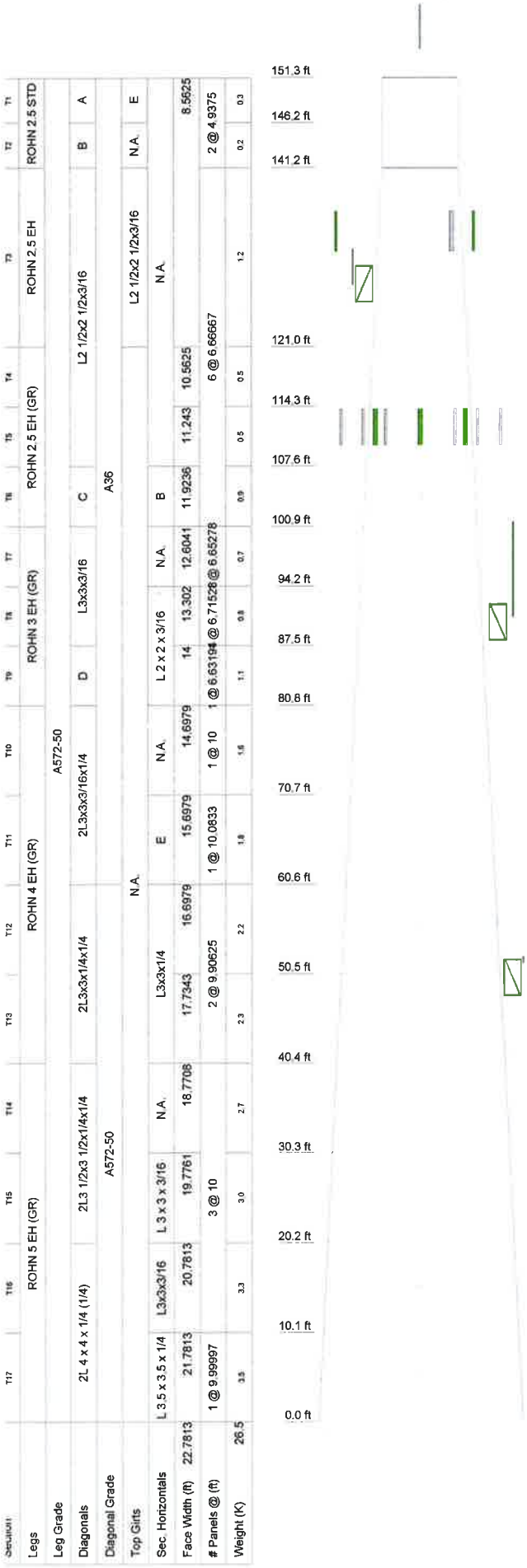
TORQUE 36 kip-ft
REACTIONS - 103 mph WIND

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 103 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Grouted pipe fc is 7 ksi
9. TOWER RATING: 79.8%

Paul J Ford and Company
250 E. Broad Street Suite 600
Columbus, OH
Phone: 43215
FAX: 614.448.4105

Job:	Modified 152-ft S/S Tower; East Lyme,		
Project:	BU #806384 (PJF #37516-3357)		
Client: Crown Castle	Drawn by: Matthew R Buske	App'd:	
Code: TIA-222-G	Date: 10/14/16	Scale: NT	
Path:		Dwg No. E	



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L 1.5 x 1.5 x 3/16	D	2L 3 x 3 x 3/16 (1/4)
B	L 2 x 2 x 3/16	E	L2 1/2x2 1/2x3/16
C	2L 2.5 x 2.5 x 3/16 (3/16)		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 103 mph basic wind in accordance with the TIA-222-G Standard.
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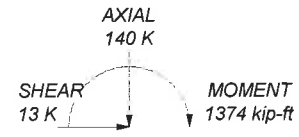
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Grouted pipe f'c is 7 ksi
9. TOWER RATING: 79.8%

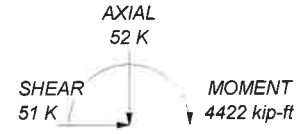
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 242 K
SHEAR: 31 K

UPLIFT: -199 K
SHEAR: 27 K



TORQUE 10 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 36 kip-ft
REACTIONS - 103 mph WIND

Paul J Ford and Company
250 E. Broad Street Suite 600
Columbus, OH
Phone: 43215
FAX: 614.448.4105

Job:	**Modified 152-ft S/S Tower; East Lyme,**		
Project:	**BU #806384 (PJF #37516-3357)**		
Client: Crown Castle	Drawn by: Matthew R Buske	App'd:	
Code: TIA-222-G	Date: 10/14/16	Scale:	NT
Path:		Dwg No.	E

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Page 1 of 1
By MRB Date 10/14/2016
Project # 37516-3357

Existing and Post-Installed Anchor Rod Capacity

Loads

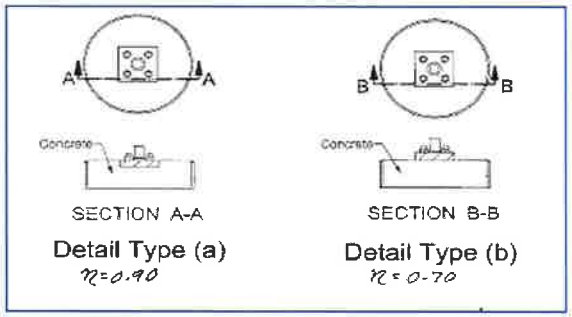
Uplift :	199	kips	1.00	Maximum Ratio
Shear :	27	kips		

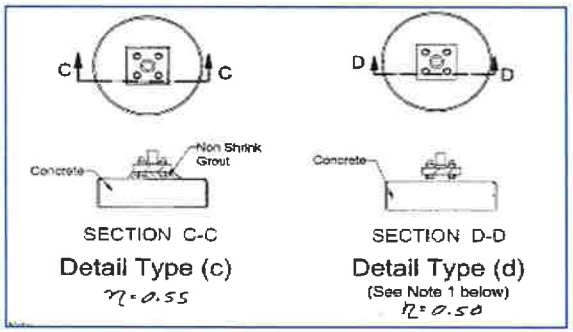
Existing Anchor Rods

Anchor Rod Condition (n) :	0.55	
Anchor Rod ø :	1	in
Anchor Rod Quantity :	4	
Anchor Rod Grade :	A354 Gr. BC (1/4 to 2-1/2 incl.)	
F_y :	109	ksi
F_u :	125	ksi
Threads per Inch :	8	
Total Net Area :	2.42	in^2
Applied Tensile Load :	132.67	kip
Applied Shear Load :	18.00	kip
ϕ :	0.8	
Total Anchor Rod Capacity ϕRnt :	242.30	kip
Existing Anchor Rod Ratio :	0.683	
		inches
		k-in
	33.13	kips
	60.57	kips
	10.44	k-in
Interaction Ratio :		
Governing Stress Ratio :	0.683	

Post-Installed Anchor Rods

Anchors Take Shear Load :		
Anchor Rod ø :	1	in
Anchor Rod Quantity :	2	
Anchor Rod Grade :	A193 Gr B7	
F_y :	105	ksi
F_u :	125	ksi
Threads per Inch :	8	
Total Net Area :	1.21	in^2
Applied Tensile Load :	66.33	kip
Applied Shear Load :	9.00	kip
ϕ :	0.8	
Total Anchor Rod Capacity ϕRnt :	121.15	kip
Post-Installed Anchor Rod Ratio :	0.683	
		inches
		k-in
	33.13	kips
	60.57	kips
	10.05	k-in
Interaction Ratio :		





Factored Foundation Loads:

	Comp	Uplift	
Factored Axial Load (+Comp, -Ten) =	242	-199	kips
Factored Horiz. Load at Top of Pier =	31	27	kips
Factored OTM at Top of Pier =	0	0	kips

LRFD Resistance and Load Factors:

	Φ	Dead Load Factors	
Soil Bearing =	0.75		
Soil Weight =	0.9	1.2	0.9
Concrete Weight =	0.9	1.2	0.9

Soil Properties:

Depth to Water Table =	99	ft
Uplift Cone from	Top	of footing
Depth to Ignore for Uplift and PP =	0	ft

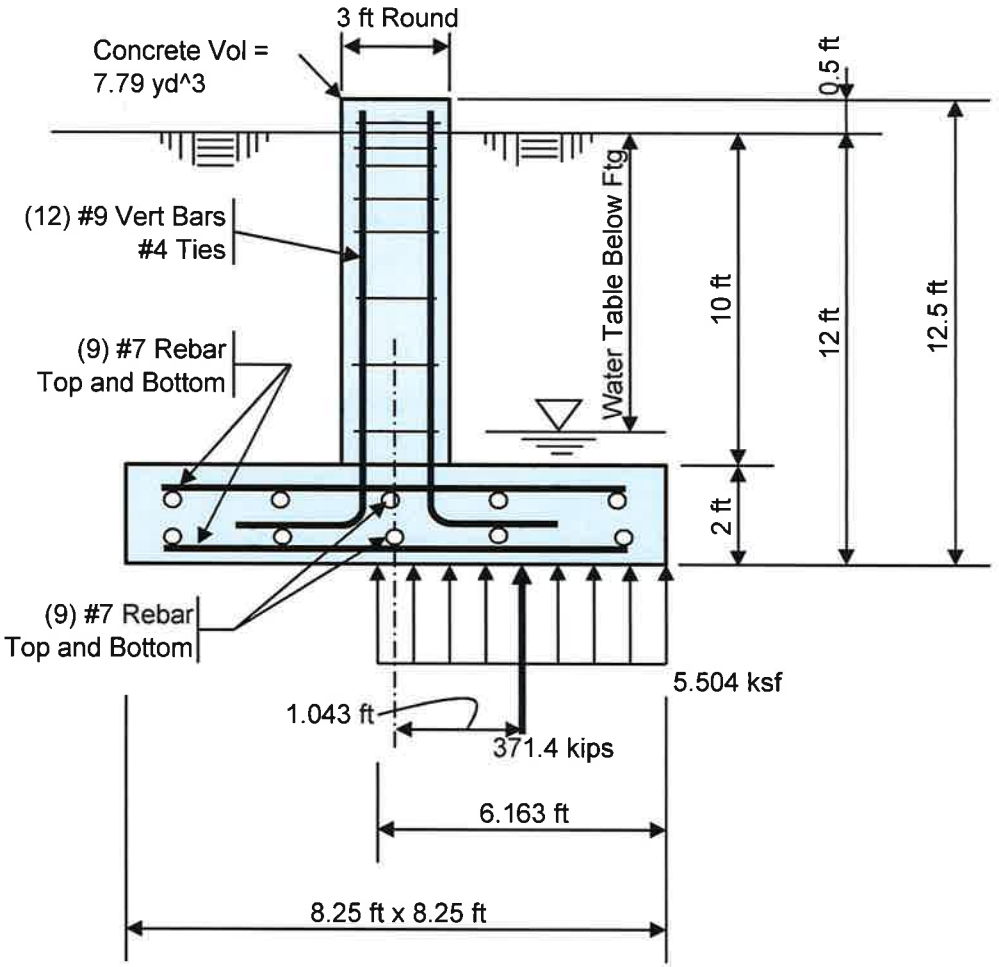
Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
12	125	0	31	12	12.00

Dimensions:

Pier Shape =	Round	
Pier Width =	3	ft Diameter
Pier Height above Grade =	0.5	ft
Depth to Bottom of Footing =	12	ft
Footing Thickness =	2	ft
Footing Width, B =	8.25	ft
Footing Length, L =	8.25	ft

Concrete:

Concrete Strength =	3	ksi
Rebar Strength =	60	ksi



Total Pad Reinf Stl =	10.80	in^2 >= 4.28 in^2 = Min Stl, OK
Total Pier Reinf Stl =	12.00	in^2 >= 5.09 in^2 = Min Stl, OK
Footing Thickness =	2.00	ft >= 1.69 ft = Min Ftg Thk, OK

Summary Results:

	Required		Available		
Maximum Net Soil Bearing =	5.516	ksf	9.000	ksf	Stress Ratio = 61.3% in Soil Bearing
Uplift =	199.0	kips	262.7	kips	Stress Ratio = 75.8% in Uplift
Punching Shear Stress =	0.066	ksi	0.164	ksi	Stress Ratio = 40.2% in Punching Shear
Bending Shear Stress =	58.8	kips	160.1	kips	Stress Ratio = 36.7% in Bending Shear
Bending Moment =	242.58	k-ft	462.8	k-ft	Stress Ratio = 52.4% in Bending Moment
Conc Pier Reinforcing Steel =	283.5	k-ft	516.4	k-ft	Stress Ratio = 54.9% in Pier Rebar

ATTACHMENT 4


Transer Station
RIVER VIEW R
WOODLAND ROAD
ROXBURY

Property Location: 91 ROXBURY RD | **MAP ID:** 15.0/ 2/ / / | **Bldg Name:** | **State Use:** 9030

Vision ID: 4697 | **Account #** 007627 | **Bldg #:** 1 of 1 | **Sec #:** 1 of 1 | **Card** 1 of 1 | **Print Date:** 02/16/2012 16:44

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
EAST LYME TOWN OF	2 Above Street		1 Paved	2 Suburban
P O BOX 519				
NIANTIC, CT 06357				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:	Block
Sub-Div	Fire 000
Photo	Tot Disabled
Devl Lot #	Heart
Vet Exempt	Freeze
Tract 07161	
GIS ID: 15.0 2	ASSOC PID#

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
EX COM LN	21	260,500	182,350
EX COM BL	22	12,100	8,470
EX CM OTB	25	64,100	44,870
	Total	336,700	235,690

6045
EAST LYME, CT

VISION

RECORD OF OWNERSHIP

	BK-VOL/PAGE	SALE DATE	q/u	w/i	SALE PRICE	V.C.
EAST LYME TOWN OF	173/ 522	11/10/1977			0	

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2011	21	182,350	2011	21	182,350	2010	21	209,440
2011	22	8,470	2011	22	8,470	2010	22	8,470
2011	25	44,870	2011	25	44,870	2010	25	44,870
	Total:	235,690		Total:	235,690		Total:	262,780

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD NAME	STREET INDEX NAME	TRACING	BATCH
0045/A				

NOTES

LANDFILL MAINT
LEASE 818/304
TOWER IN MIDDLE=PP
10/1/02 ELECTRONIC BLDG
10/1/05 ADD SHED &1/2 BTH
BTH=2 - 1/2BTHS
AMEND 778/734

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	12,100
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	64,100
Appraised Land Value (Bldg)	260,500
Special Land Value	0
Total Appraised Parcel Value	336,700
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	336,700

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
B110401-2	04/18/2011	CM	Commercial	4,500		0		INSTALL TELECOM C/
E17305	10/19/2005	CM	Commercial	600		100	10/01/2006	INSTALL
B15081	10/15/2004	CM	Commercial	1,000		100	10/01/2005	MATERIAL SHED AT T
B14975	09/28/2004	CM	Commercial	1,500		100	10/01/2005	8X14 SHED
B14976	09/28/2004	CM	Commercial	2,000		0		1/2 BATH IN BUILDING
B7744	08/01/2002	CM	Commercial	60,000	10/01/2002	100	10/01/2002	ELECTRNIC BLDG
B8652	01/31/2002	CM	Commercial	2,000		100		ADD 1/2 BATH

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
3/23/2011			AD	00	Measur+Listed
10/1/2002			NW	55	Building Permit Change
8/31/2001			NS	00	Measur+Listed
7/18/2000			NS	00	Measur+Listed
12/3/1990			RT	00	Measur+Listed

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Frontage	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	Adj. Unit Price	Land Value
1	903C	MUNICIPAL MDL-94	R40				40,000	SF	3.09	1.25	B	1.0000	1.00	0045	0.70			2.70	108,200
1	9030	MUNICIPAL MDL-96	R40				43.91	AC	6,500.00	1.25	B	1.0000	0.60	0045	0.70	R		3,412.50	149,800
1	9030	MUNICIPAL MDL-96	R40				4.48	AC	6,500.00	1.25	B	1.0000	0.10	0045	0.70	W		568.75	2,500

4697 | **Total Card Land Units:** 49.31 AC | **Parcel Total Land Area:** 49.31 AC | **Total Land Value:** 260,500

Property Location: 91 ROXBURY RD **MAP ID:** 15.0/ 2/ / / **Bldg Name:** **State Use:** 9030

Vision ID: 4697 **Account #** 007627 **Bldg #:** 1 of 1 **Sec #:** 1 of 1 **Card** 1 of 1 **Print Date:** 02/16/2012 16:44

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	12		Commercial
Model	94		Commercial
Grade	01		Low Cost
Stories	1		
Occupancy	1		
Exterior Wall 1	15		Concr/Cinder
Exterior Wall 2			
Roof Structure	03		Gable/Hip
Roof Cover	03		Asph/F Gls/Cmp
Interior Wall 1	01		Minim/Masonry
Interior Wall 2			
Interior Floor 1	03		Concr-Finished
Interior Floor 2			
Heating Fuel	03		Gas
Heating Type	03		Hot Air-no Duc
AC Type	01		None
Bldg Use	903C		MUNICIPAL MDL-94
Total Rooms			
Total Bedrms	00		
Total Baths	1		
Heat/AC	00		NONE
Frame Type	03		MASONRY
Baths/Plumbing	00		NONE
Ceiling/Wall	00		NONE
Rooms/Prtns	01		LIGHT
Wall Height	10		
% Comn Wall	0		

CONSTRUCTION DETAIL (CONTINUED)

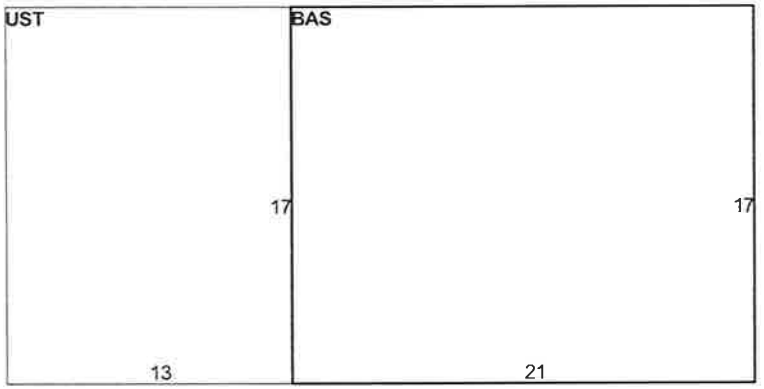
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
903C	MUNICIPAL MDL-94	100

COST/MARKET VALUATION

Adj. Base Rate:	40.70
Section. RCN:	17,217
Net Other Adj:	0.00
Replace Cost	17,217
AYB	1956
Dep Code	AV
Remodel Rating	
Year Remodeled	
Dep %	30
Functional Obslnc	0
External Obslnc	0
Cost Trend Factor	1
Condition	
% Complete	
Overall % Cond	70
Apprais Val	12,100
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	



No Photo On Record

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
	GATE HS			L	128	16.00	2001		0		100	2,000
SHD1	SHED FRAME			L	150	8.00	2002		0		100	1,200
ELCB	ELECTELCOM			L	1	60,000.00	2002		0		100	60,000
SHD1	SHED FRAME			L	112	8.00	2005		0		100	900

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
BAS	First Floor	357	357		40.70	14,531
UST	Utility, Storage, Unfinished	0	221		12.16	2,686
	Ttl. Gross Liv/Lease Area:	357	578			17,217

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here ***Postmark with Date of Receipt.***
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103			
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Mark C. Nickerson, First Selectman Town of East Lyme 108 Pennsylvania Avenue Niantic, CT 06357				
2.	Gary A. Goeschel, II, Director of Planning Town of East Lyme 108 Pennsylvania Avenue Niantic, CT 06357				
3.					
4.					
5.					
6.					